The Afghanistan Engineering Support Program assembled this deliverable. It is an approved, official USAID document. Budget information contained herein is for illustrative purposes. All policy, personal, financial, and procurement sensitive information has been removed. Additional information on the report can be obtained from Firouz Rooyani, Tetra Tech Sr. VP International Operations, (703) 387-2151.

GEOTECHNICAL REPORT

FOR

Gardez to Khost Bridge No. 9, Afghanistan

ARRANGED BY



Soil Investigation Laboratory Kabul Afghanistan

SUBMITTED TO



February 04, 2014



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1- INTRODUCTION

1.1. Purpose

This report presents the results of a Geotechnical Site Assessment prepared by KA Labs, for the proposed "(Gardez to Khost Bridge No. 9 Afghanistan)".

The purpose of the assessment was to provide recommendations for the design of foundations and other geotechnical aspects of the proposed construction.

1.2. Scope of Services

The scope of work included the following:

- Conduct a subsurface investigation.
- ➤ Conduct basic laboratory testing of select soils.
- ➤ Perform a geotechnical engineering analysis regarding the proposed construction, using the information obtained from the subsurface investigation and laboratory testing.
- ➤ Prepare this report of our findings, conclusions, and tentative recommendations for the geotechnical engineering aspects of the proposed construction.

1.3. Authorization

This assessment was performed and the report prepared in general accordance with our proposal. KA Labs received authorization from TETRA TECH, to proceed with the work.

1.4. Standard of Care

The services performed by KA Labs were conducted in a manner consistent with the level of ca re and skill ordinarily exercised by members of the geotechnical profession practicing contemp oraneously under similar conditions in the locality of the project. No other warranty, expressed or implied, is made.

Limitations of this report are discussed in Section 9, page 16. These limitations further explain the realities of geotechnical engineering and the limitations that exist in evaluating geotechnical issues.

This report has been prepared for the exclusive use of TETRA TECH, with specific application to the proposed project.



2- PROJECT INTRODUCTION

2.1. Proposed Development

It is understood that the proposed development "Gardez to Khost Bridge No. 9, Afghanistan)" will consist of two segments of 38.46 m bridge, Culvert and retaining wall, as shown on the Site Plan in Appendix A.

If the locations of the assumed loadings, proposed structures, or any other site features
Change from what is shown on the site plan included in this report, KA Labs should be
notified so that the changes can be reviewed to determine if the recommendations presented in this report are still applicable.

2.2. Site Description

The bridge is located along of Gardez to Khost Road Bridge No. 9, at KM = 50+019.974 to, 50+058.453. A site plan is enclosed in Appendix A.

Type of soils per ASTM D-2487-06 (Unified Soil Classification System) standard:

[CL-ML, SM, GM, GC-GM, GW, GP and GW-GM], [Sandy Silty Clay, Silty Clay with Sand, Silty Sand with Gravel, Silty Gravel with Sand, Silty Clayey Gravel with Sand, well Graded Gravel with Silt & Sand, Poorly Graded Gravel, Well graded gravel with Sand].

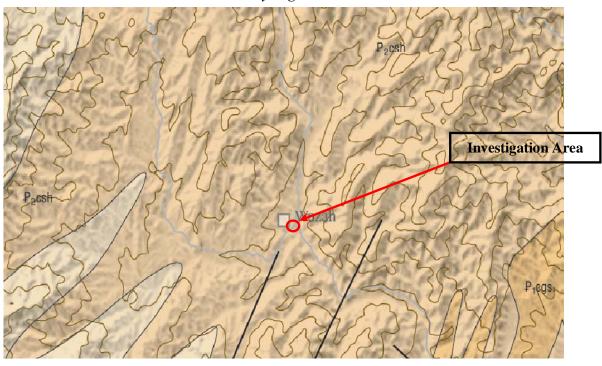
₽₁cgs



3- GENERAL GEOLOGICAL CONDITIONS

Site project Area is located on $\underline{P_2}$ csh Clay and shale (Eocene)—Clay, shale, siltstone more abundant than sandstone, limestone, marl, gypsum, conglomerate.

Location of project area Gardez to Khost Bridge No. 9, Afghanistan) in geological map has shown by Figure No. 1.



(Compiled by Ronalld R.Wahl, 2005)
Figure No.1. Geological location of Gardez to Khost Bridge No. 9, Afghanistan

Clay and shale (Eocene)—Clay, shale, siltstone more abundant than sandstone, limestone, marl, gypsum, conglomerate

Conglomerate and sandstone (Paleocene)—Conglomerate, sandstone more abundant than siltstone, limestone, shale; mafic volcanic rocks



4- SEISMIC HAZARD

Each year Afghanistan is struck by moderate to strong earthquakes, and every few years, a powerful earthquake causes significant damage or fatalities. As Afghanistan rebuilds following decades of war and strife, new construction and development need to be designed to accommodate the hazards posed by strong earthquakes.

Earthquakes in Afghanistan are most abundant in and near the northeastern part of the country where the effects of the plate collision between India and Asia are most pronounced. In this region, tectonic forces have created the mountains of the Hindu Kush and Pamir's along with frequent moderate to large earthquakes.

Historical accounts show that the damaging earthquakes have also occurred elsewhere, even in the seismically less active parts of the country; the map of earthquakes in Afghanistan shows that the frequency and size of earthquakes varies across the country and so does the hazard.

Table No:1. Probabilistic ground motions for selected cities (USGS, 2007).

		2	2%		10)%				
	Probability of exceedance in 50 years									
City	Lat.	Long.	PGA (%g)	0.2 sec	1.0 sec	PGA	0.2 sec	1.0 sec		
Kabul	34.53	69.17	48	113	53	25	57	22		
Mazar-e Sharif	36.70	67.10	33	78	22	16	37	11		
Herat	34.35	62.18	28	62	24	7	15	4		
Kandahar	31.61	65.69	13	30	16	7	16	8		

The long history of earthquakes throughout much of Afghanistan highlights the need to understand the level of hazard in various parts of the country. By combining our data on the locations, sizes, and frequencies of earthquakes with the locations and estimated activity rates of major faults, scientists can forecast the probable levels of future ground shaking. The likelihood of this shaking is represented on seismic-hazard maps; the maps show the probability of exceeding a certain strength of shaking in a 50-year time period. The hazard maps show that the likelihood of strong shaking in the next 50 years is highest in northeastern Afghanistan and along the corridor adjacent to the Chaman fault system.



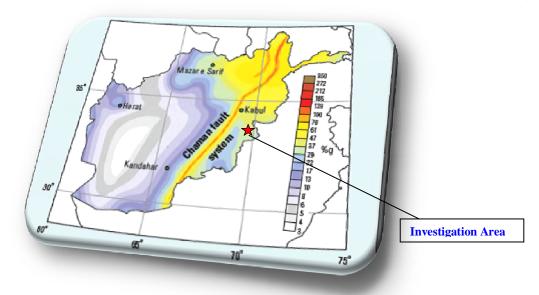


Figure No.2: Afghanistan Seismic hazard map (USGS, 2007)

Generalized seismic-hazard map of Afghanistan showing the level of shaking (peak ground acceleration measured as a percentage of the force of gravity, (g) that is likely to occur with a 2-percent probability in the next 50 years. This probability is equivalent to saying that the strength of shake at a particular site will probably be exceeded every 2,500 years. Warm colors show higher hazard, and cool colors show lower hazard. The strongest expected shaking is concentrated on major active faults in eastern and northeastern Afghanistan.

5- INVESTIGATION AND TESTING

5.1. Subsurface Investigation

For investigate of subsurface material description in proposed project area and subsurface soil conditions in proposed project area, according to Scope of Work documents of project for geotechnical study and AED design the field investigation included the following:

The borings were advanced through auger method to determine of engineering the characteristics of the subsurface materials of The field investigation included a reconnaissance of the this project site, Drilling of Boreholes with 8 meters Depth, performing standard penetration tests.

For the purpose of subsurface soil classification, soil sampling, field density testing and laboratory soil tests, totally (9) Nine Borehole drilled to depth of 8 meters below the existing ground surface, 5 borehole drilled at the footing of bridge, 2 borehole drilled for Retaining wall and also 2 borehole drilled for culvert.

Borehole locations depicted on the Site Plan (Appendix A)



Boreholes drilling Soil sampling were performed under the supervisor of KA geotechnical engineering representative, the KA geotechnical engineering representative extended detailed logs of the subsurface materials and conditions encountered during the boring and excavations, and collected representative samples.

Boreholes Log depicted on (Appendix B)

The Boreholes Drilling were carried out on January 2014 using XY Core Drill Rig Machine on footprint of Bridge, Calvert and Retaining wall on Gardez to Khost Bridge No. 9, Afghanistan Project.

The Soil samples were obtained & SPT Test has performed (per 1 meter interval) depths in the Boreholes.

5.1.1. Field density test by sand cone method

for the determination of the in-place density and unit weight of undisturbed or in-situ soils in according to ASTM D-1556 used from this method. The soil or other material being tested should have sufficient cohesion or particle attraction to maintain stable sides on a small hole or excavation, and be firm enough to withstand the minor pressures exerted in digging the hole and placing the Apparatus over it, without deforming or sloughing.

Based on field density tests determined Natural Field Density varies between 2.105 gm/cc and 2.213 gm/cc.

5.1.2. Standard penetration test (SPT)

Standard penetration tests were performed During the sampling procedures in the Boreholes (per 1 meter interval) depths in conjunction with the split-barrel sampling. The standard penetration value (N) is defined as the number of blows of a 140-pound hammer, falling thirty inches, required to advance the split-spoon sampler One-foot into the soil (ASTM D-1586).

In this site area the SPT blow counts (N-Value) per ASTM D-1586 are in the in different strata in the range of 12 to 24 blows counts and Refusal.



5.2. Laboratory Testing

Laboratory tests were carried out in a number of selected soil samples in order to acquire necessary information with regards to the physical and mechanical properties of the soil layers and further on to evaluate and determine the parameters required for the calculations. A ll phases of the laboratory testing program were performed in general accordance with the applicable ASTM Specifications.

The following tests were conducted on the selected soil samples:

- ✓ Soil Classification and Gradation ASTM D422
- ✓ Atterberg Limits ASTM D4318
- ✓ Moisture Content ASTM D2216
- ✓ Maximum Dry Density ASTM D1557
- ✓ Expansion index (ASTM D4829)
- ✓ Specific Gravity (ASTM D854)
- ✓ Sulfate Content ASTM C1580
- ✓ Chloride Content ASTM D1411
- ✓ pH ASTM E7

The details of all lab tests are presented in Appendix D. The samples collected are stored for 30 days from the date of issue of this report, and then disposed of unless otherwise instructed in writing by the client.



6- Calculations of the Bearing Capacity

Calculations of the Bearing Capacity The ultimate bearing capacity is the loading intensity that causes failure and lateral displacement of foundation materials and rapid settlement. The ultimate bearing capacity depends on the size and shape of the loaded area, the depth of the loaded area below the ground surface, groundwater conditions, the type and strength of foundation materials, and the manner in which the load is applied. The design bearing pressure equals the ultimate bearing capacity divided by a suitable factor of safety.

For evaluate the Allowable bearing capacity there are different methods as below:

1st) Allowable Bearing Capacity based on new edition Terzaghi equation (Braja, M.Das, Principle of Geotechnical Engineering, 5th edition, 2002).

Based on new edition Terzaghi equation Allowable Bearing Capacity Calculation

For calculation of the Allowable bearing capacity based on the physical and mechanical parameters of soil and foundation dimensions, has used the new Terzaghi ultimate bearing capacity equation.

Terzaghi suggest below equation for calculation of Ultimate Bearing Capacity for Shallow Foundations:

For Rigid and Square Foundation and $d \ge B$:

Then we will use Local Shear Failure Formula via Terzaghi new edition:

(Reference: Braja, M.Das, Principle of Geotechnical Engineering, 5th edition, 2002)

$Qu = 1.3cNc + qNq + 0.4\gamma BN\gamma$

Qu = Ultimate Bearing capacity (KN/m²)

Ground Water Level (GWL) not encountered to the water Table in dig borehole to 0.35-5.35 meter below the ground surface.

And:

Nc, Nq, Ny = Coefficients have selected from the reference table

[Reference: Braja, M.Das, 2002, chapter 15, table 15-1 page 510]



For finding the values parameters on equation:

According to direct shear test results

 Φ = Angle of internal friction (Degrees),

 $C = Cohesion of soil (KN/m^2),$

C = 10.79 (KN/m2) $\Phi = 30.9 \text{ }^{\circ} \sim 31^{\circ}$

According to field density test results:

γ (minimum Natural field density) = 2.105 gm/cc Equals 20.64 KN/m2

According to (Braja, M.Das, 2002) Table for $\varphi = 31^{\circ}$

Nc = 40.41 Nq = 25.28 $N\gamma = 22.65$

Wide of Foundation (B) = l *m for Example*

Depth of Foundation (Df) = for Df=0.8 m

Safety Factor (SF) =S.F=3

 $q = Surcharge = \gamma D_f$

 $q = \gamma Df = 20.64 \times 0.8 = 16.51 \text{ KN/m2}$

Back to Equation:

 $Qu = 1.3cNc + qNq + 0.4 \gamma BN\gamma$

 $Qu = (1.3 \times 10.79 \times 40.41) + (16.51 \times 25.28) + (0.4 \times 20.64 \times 1 \times 22.65)$

Qu = 566.83 + 417.48 + 187.03 (KN/m2)

Qu = 1171.34(KN/m2)

And

Qa (Allowable Bearing Capacity) = $\frac{Qu}{SF}$

 $Qa=1171.34/3=390.44 \text{ KN/m}^2 \text{Equal}=3.98 \text{ kg/cm}^2......\text{For } B=1 \text{ meter}$

The Calculated soil bearing capacity is assumed for a footing wide (B) of 1 meters.

If footing designed per design documents that the footing wide (B) are Small or larger than 1 meter the allowable bearing capacity will change according to this formula:

Qa = 188.9 + 139.16 + 62.34B (KN/m2)



7- Settlement Calculation

A structure can generally tolerate large uniform, or nearly uniform, settlements.

Generally, essential conditions for occurrence the consolidation Settlement are:

- 1. Existence of clay soils
- 2. Shallow water table level

According to lab Test Findings of sieve analysis, Atterberg limits the below Results are achieved:

General soil type in this project area

[CL-ML, SM, GM, GC-GM, GW, GP and GW-GM], [Sandy Silty Clay, Silty Clay with Sand, Silty Sand with Gravel, Silty Gravel with Sand, Silty Clayey Gravel with Sand, well Graded Gravel with Silt & Sand, Poorly Graded Gravel, Well graded gravel with Sand]

Also, according to collect Field data regarding groundwater table in the project area, Ground Water Level (GWL) not encountered to the water Table in dig borehole to 0.35-5.35 meter below the ground surface.

Therefore, according to soil Type and groundwater table possibility of occurrence Consolidation settlement is not possible.

(Principles of Geotechnical Engineering, Braja M. Das, 2nd 1941 zand 5th edition, 2002)

 $S_t = Total \ Settlement$

 $S_{e} = immediate \ settlement$

 $S_{c} = primary \ consolidation \ settlement$

 $S_s = secondary consolidation settlement$



> immediately Settlement Estimation for this Project According To below.

(Principles of Geotechnical Engineering, Braja M. Das, 2nd edition):For Rigid Foundation:

$$S_e = \frac{Bq_0}{E_s}(1 - \mu^2)\alpha_r$$



Table No: 1. The values of ar for various types of foundation, [Reverence: Berja. M. Das,

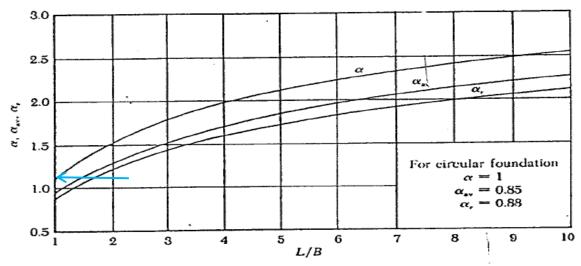


Table no.2. Representative Values of Poisson's Ratio for soils [Reference: Berja. M. Das, 2002, p262, table 10-3]

Soil type	Poisson's Ratio (µs)
Loose sand	0.2-0.4
Medium dense sand	0.25-0.4
Dense sand	0.3-0.45
Silty sand	0.2-0.4
Soft clay	0.15-0.25
Medium dense clay	0.2-0.5

Table No.3. Representative Values of the Modulus of Elasticity of soils, [Reference: Berja. M. Das, 2002, p262, table 10-2]



Soil Type	Elasticity Modulus (Es)							
	Kg/cm2	KN/m2						
Soft clay	18.5-35	1800-3500						
Hard clay	60-140	6000-14000						
Loose sand	105-280	10000-28000						
Dense sand	350-700	35000-70000						

$$S_e = \frac{Bq_0}{E_c} (1 - \mu^2) \alpha_r$$

B= width of foundation (1 meter): for Example.

 q_0 = net pressure applied or surcharge pressure 390.45 (kN/m²).

Es= module of elasticity (from Representative Values of the Modulus of Elasticity of soils [Reference: Berja. M. Das, 2002, p262, table 10-2]) (Table no:3) = 10000 KN/m2 for Loose sand..

 μ = Poisson's ratio [Table No.2] = 0.2 for Loose sand.

 $\alpha r = from \ table \ (L/B = 1) \ where \ L \ (length) \ and \ B \ (width) \ of foundation = 0.9 \ [Table \ No.1]$

$$S_e = \frac{Bq_0}{E_s} (1 - \mu^2) \alpha_r$$

$$S_e = \frac{1 \times 390.45}{10000} (1 - 0.2^2)0.9$$

Final Suggestion for immediate Settlement:

we suggest the estimating settlement by formula:

$$S_e = \frac{Bq_0}{E_s} (1 - \mu^2) \alpha_r$$

For $B = 1m Se = 0.033735(m)$

8- Lateral Earth Pressure Calculation

There are categories of lateral earth pressure and each depends upon the movement experienced by the vertical wall on which the pressure is acting.



The three categories are:

- At rest earth pressure
- Active earth pressure
- Passive earth pressure

Calculation of Lateral Earth Pressure Coefficients:

According to the direct shear test result, minimum of friction angle (ϕ) of soil is 31° and Cohesion $(C) \approx 0.00$ Kpa.

At Rest Earth Pressure Coefficient (K0): $k_0 = 1 - \sin \phi$

$$K_0 = 1 - Sin \emptyset$$
 \longrightarrow $K_0 = 1 - Sin 31 \longrightarrow$ $K_0 = 0.49$

Active Earth Pressure Coefficient (Ka):

$$Ka = tan^2 \left[45 - \frac{\emptyset}{2} \right] \longrightarrow Ka = tan^2 \left[45 - \frac{31}{2} \right] \longrightarrow K_a = 0.32$$

Passive Earth Pressure Coefficient (Kp):

$$Kp = tan^2 \left[45 + \frac{\emptyset}{2} \right]$$
 \longrightarrow $Kp = tan^2 \left[45 + \frac{31}{2} \right]$ \longrightarrow $K_p = 3.13$

Sliding:

 $\mu = \tan \delta = \tan 21 = 0.38$ (typical between concrete and soil)

9- Retaining Walls



Retaining walls are engineered structures constructed to resist lateral forces imposed by soil movement and water pressure (Dismuke and Cornfield, 1991). Although grading is necessary for construction of all retaining walls, the excavation takes place predominantly along the toe of a slope, with the upper slopes requiring little, if any alteration. Since cutting the toe of a slope can destabilize the slide, the construction of retaining walls at the toe of a slide should be undertaken only after it has been determined that the slide can remain stable during construction. Retaining walls are commonly used in combination with fill slopes to reduce the extent of a slope to allow a road to be widened and to create additional space around buildings. Retaining walls are also used as protection against the erosive forces of water and as a method of slope stabilization along highways, railroads, and construction sites (Dismuke and Cornfield, 1991). Retaining walls are also used along the coast for protection against wave damage and bluff failure. Both vertical walls and revetments can be used for protection, and the design for each must consider beach scour, storm wave height, wave run-up, tide level and future sea level conditions, as well as the geologic properties of the bluff face.

Retaining walls can be separated into categories based upon the force parameters acting on the structure to provide stability. The three types of retaining walls are anchored, gravity, and cantilever. All three can be used as coastal structures and for slope stabilization.

An anchored wall gains stability through use of tie-back systems attached to its face that oppose the tendency for sliding within an unstable slope. Additional stability can be attained when anchored walls are installed on an angle, which compresses the soil and increases stress along the failure plane (Morgenstern and Sangrey, 1982).

Anchors used in restrained structures are placed upslope from the wall and are connected to the wall by a steel tension bar or cable (Morgenstern, 1982). Inclusions are commonly used to stabilize retaining structures are passive soil anchors such as cement blocks or sheet piles tied to the retaining structure. Anchored walls are an effective method of stabilization only if the anchors are installed beyond the unstable portion of a slope in stable material and if the tendon is protected from corrosion.

A cantilever wall penetrates to a depth beyond the failure surface. Cantilever structures are different from gravity and anchored structures in that they derive their stability from the depth of penetration and the stiffness of the structure. Support and stability is maintained by the soil in which the wall is placed. Cantilever walls are not a common method of stabilization because



deep excavations often are required and the structures are generally not effective at heights in excess of 5 meters. Both factors limit the use of cantilever walls to mitigation of only the smallest hazards. As a result, cantilever walls are used most often in temporary rather than permanent structures. Cantilever walls are often constructed of sheet pile or bored pile walls, similar to anchored walls, but without anchors.

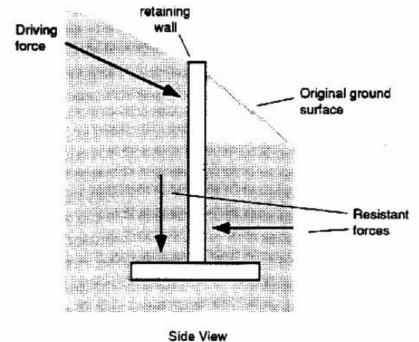


Figure 1, Retaining wall

10- SUBSURFACE CONDITIONS

10.1. Stratigraphy

Type of soils per ASTM D-2487-06 (Unified Soil Classification System) standard:

[CL-ML, SM, GM, GC-GM, GW, GP and GW-GM], [Sandy Silty Clay, Silty Clay with Sand, Silty Sand with Gravel, Silty Gravel with Sand, Silty Clayey Gravel with Sand, well Graded Gravel with Silt & Sand, Poorly Graded Gravel, Well graded gravel with Sand].

Detailed description of the type of soil layers encountered during test is given in Appendix B.

10.2. Groundwater

Water Level (GWL) not encountered to the water Table in dig borehole to 0.35-5.35 meter below the ground surface. Groundwater leels may fluctuate with seasonal climatic variations and changes in the land use. Low permeability soils will require several days or longer for groundwater to enter and stabilize in the test bore holes

Detailed description of the water level of every borehole is given in Appendix B.

11- RECOMMENDATIONS



The recommendations presented in the following sections of this report are based on the information available regarding the proposed construction, the results obtained from our field soil tests and laboratory tests, and our experience with similar projects. Because the test boreholes represent a very small statistical sampling of subsurface conditions, it is possible that conditions may be encountered during construction that are substantially different from those indicated by the soil test boreholes. In these instances adjustments to design and construction may be necessary.

This geotechnical report is based on the Site Plan and project information developed by KA LABS and the assumptions stated in this report. Changes in the proposed location or design of the structures can have significant effects on the conclusions and recommendations of the geotechnical report. KA LABS should be contacted in the event of such changes.

11.1. Site Preparation

Concrete pavement, concrete foundations and any other debris noted at or below the existing ground surface should be removed as part of the site preparation for the proposed construction area. In all new fill and excavation areas, vegetation, topsoil, roots and other deleterious materials (typically 4 to 6 inches (100 150 mm)), deemed unsuitable shall be removed from the proposed construction areas, and replaced with controlled fill. Site clearing, grubbing and stripping will need to be performed only during dry weather conditions. Operation of heavy equipment on the site during wet conditions could result in excessive rutting and mixing of organic debris with the underlying soils.

11.2. Excavations

Temporary construction slopes should be designed and excavated in strict compliance with the rules and regulations of the Federal Register, Volume 54, No. 209 (October 1989), the United States Department of Labor, Occupational Safety and Health Administration (OSHA), 29 CFR, Part 1926. This document was prepared to better insure the safety of workers entering trenches or excavations, and requires that all excavations conform to the new OSHA guidelines. The contractor is solely responsible for protecting excavations by shoring, sloping, benching or other means as required to maintain stability of both the excavation sides and bottom. KA LABS does not assume any responsibility for construction site safety or the activities of the contractor.

11.3. Structural Fill



It is recommended that structural fills be constructed as controlled, well-compacted engineere d fills. Structural engineered fill should be inorganic, low plastic clay, sand, or gravel. Any existing soils with a high organic content (browns) are suitable for reuse as fill in landscaping areas only. The intent of these recommendations is to reduce the potential for cons olidation and settlement of new fills. Laboratory testing should be performed on the fill materia ls to determine the appropriate moisture-density relationship of the fill being placed. Adjustme nts to the soil moisture by wetting or drying should be made as needed during fill placement. During grading operations, representative samples of the proposed imported structural fill mat erials should be periodically checked via laboratory testing. A full-time representative from the testing agency should be on site to monitor excavation and grading operation as well as the su itability of fill materials. Suitable fill material should be placed in thin lifts (lift thickness depe nds on type of compaction equipment, but in general, lifts of 8 inches (200 mm) loose measure ments are recommended). The soil should be compacted by the necessary compaction equipme nt to meet the specified compaction recommendations. Self-propelled compactors similar to C aterpillar Model 815 with tamping feet or sheep foot rollers may be required to adequately co mpact fine-grained fill material (silts and clay). If the fill material is granular (sands and grav els) with less than 10% clays and silts, smooth-drum vibratory compactors should be used. In a ddition, a smooth-drum roller should be provided to "seal" the fill at the end of each workday to reduce the impact precipitation. In areas undergoing removal of seepage water, the enginee red fill should be limited to well-graded sand and gravel or crushed stone. Within small excav ations, such as in utility trenches (less than 24 inches (600 mm) in width), around manholes or behind retaining walls, we recommend the use of "wacker packers", "Rammax" compactors or vibrating plate compactors to achieve the specified compaction. Loose lift thickness of 4 inches (100 mm) are recommended in small area fills. We recommend that structural fill and backfill be compacted in accordance with the criteria st

We recommend that structural fill and backfill be compacted in accordance with the criteria st ated in Table 4. A qualified field representative should periodically observe fill placement oper ations and perform field density tests at various locations throughout each lift, including trenc h backfill, to indicate if the specified compaction is being achieved.



TABLE 4-STRUCTURAL FILL PLACEMENT GUIDELINES

Areas of Fill Placement	Compaction Recommendation	Moisture Content
	(ASTM D698-Standard Proctor)	(Percent of Optimum)
Granular cushion beneath	95%	0 to ±5%
Floor Slab and over Footings		
Structural fill supporting Footings	95%	0 to ±5%
Structural fill placed within 5 feet	95%	0 to ±5%
beyond the perimeter of the		
structure pad		

Compaction of any fill by flooding is not considered acceptable. This method will generally not achieve the desired compaction and the large quantities of water will tend to soften the foundation soils.

11.4. Geotechnical Recommendations

The following conclusions and recommendations are made based on the results of geotechnical investigations carried out at the Gardez to Khost Bridge No. 9, Afghanistan site:

- a) Type of soils per ASTM D-2487-06 (Unified Soil Classification System) standard: [CL-ML, SM, GM, GC-GM, GW, GP and GW-GM], [Sandy Silty Clay, Silty Clay with Sand, Silty Sand with Gravel, Silty Gravel with Sand, Silty Clayey Gravel with Sand, well Graded Gravel with Silt & Sand, Poorly Graded Gravel, Well graded gravel with Sand].
- b) Final Suggestion for Allowable Bearing Capacity

We suggest using maximum Allowable bearing capacity $Qa=390.44 \ KN/m^2 Equal=3.98 \ kg/cm2......For \ B=1 \ meter$

c) Final Suggestion for immediate Settlement:

we suggest estimating the settlement by formula:

$$S_e = \frac{Bq_0}{E_s}(1-\mu^2)\alpha_r$$

For $B=1m Se=0.033735 (m)$

- d) Water Level (GWL) not encountered to the water Table in dig borehole to 0.35-5.35 meter below the ground surface on investigation Date (January 2014)
- e) Based on the subsoil conditions, the proposed buildings may be supported on spread footings placed at a depth not less than 0.8 m depth below the existing ground level.



f) We suggest using all type of foundation such as Single, Strip and Mat footings Suggested with combined Reinforced concrete (R.C) just with considering the calculated Bearing capacity.

12- LIMITATIONS

This report was prepared for the exclusive use of Gardez to Khost Bridge No. 9, Afghanistan. The report may not be relied upon by any other person or entity without the written permission of KA Labs. This report was prepared in accordance with current, generally accepted geotechnical engineering practices. No other warrantee is provided. KA Labs should be allowed the opportunity to review the geotechnical aspects of plans and specifications prior to construction, to allow confirmation of the correct interpretation of the recommendations provided in this report. Foundation, earthworks, underground construction, and pavement construction should be undertaken only with full time monitoring by qualified personnel. KA LABS can provide these services on request. The conclusions and recommendations submitted in this report are based upon the data obtained from a limited number of widely spaced subsurface explorations. The nature and extent of variations between these explorations may not become evident until construction or further investigation. If variations or other latent conditions do become evident, it will be necessary to re evaluate the recommendations of this report. The recommendations contained herein are not intended to dictate construction methods or sequences. Instead, they are furnished solely to help designers identify potential construction problems related to foundation and earth plans and specifications, based upon findings derived from sampling. Depending upon the final design chosen for the project, the recommendations may also be useful to personnel who observe construction activity. Potential contractors for the project must evaluate potential construction problems on the basis of their review of the contract documents, their own knowledge of and experience in the local area, and on the basis of similar projects in other localities, taking into account their own proposed methods and procedures. The Scope of Services did not include any environmental assessment for the presence or absence of wetlands or hazardous or toxic materials in the soil, surface water, groundwater, or air, on or below or around this site. Any statements in this report or on the bore hole logs regarding odors, colors or unusual or suspicious items or conditions are strictly for the information of the client.



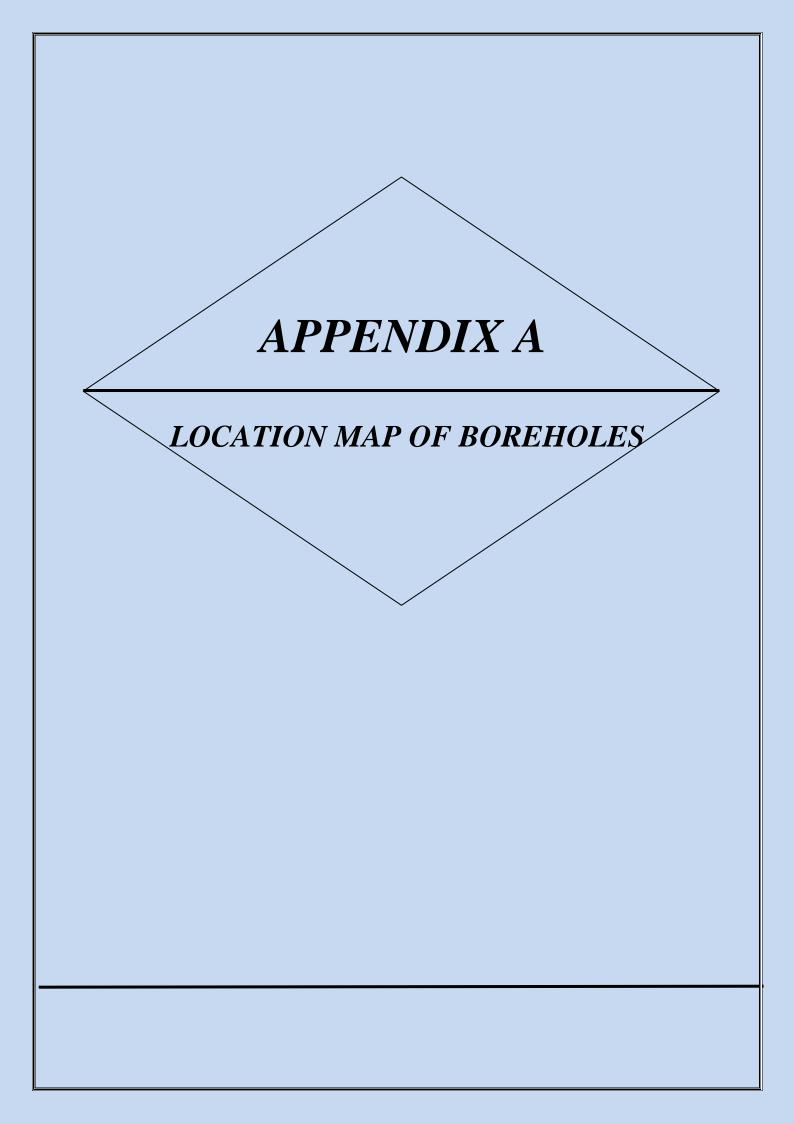
13- CLOSURE

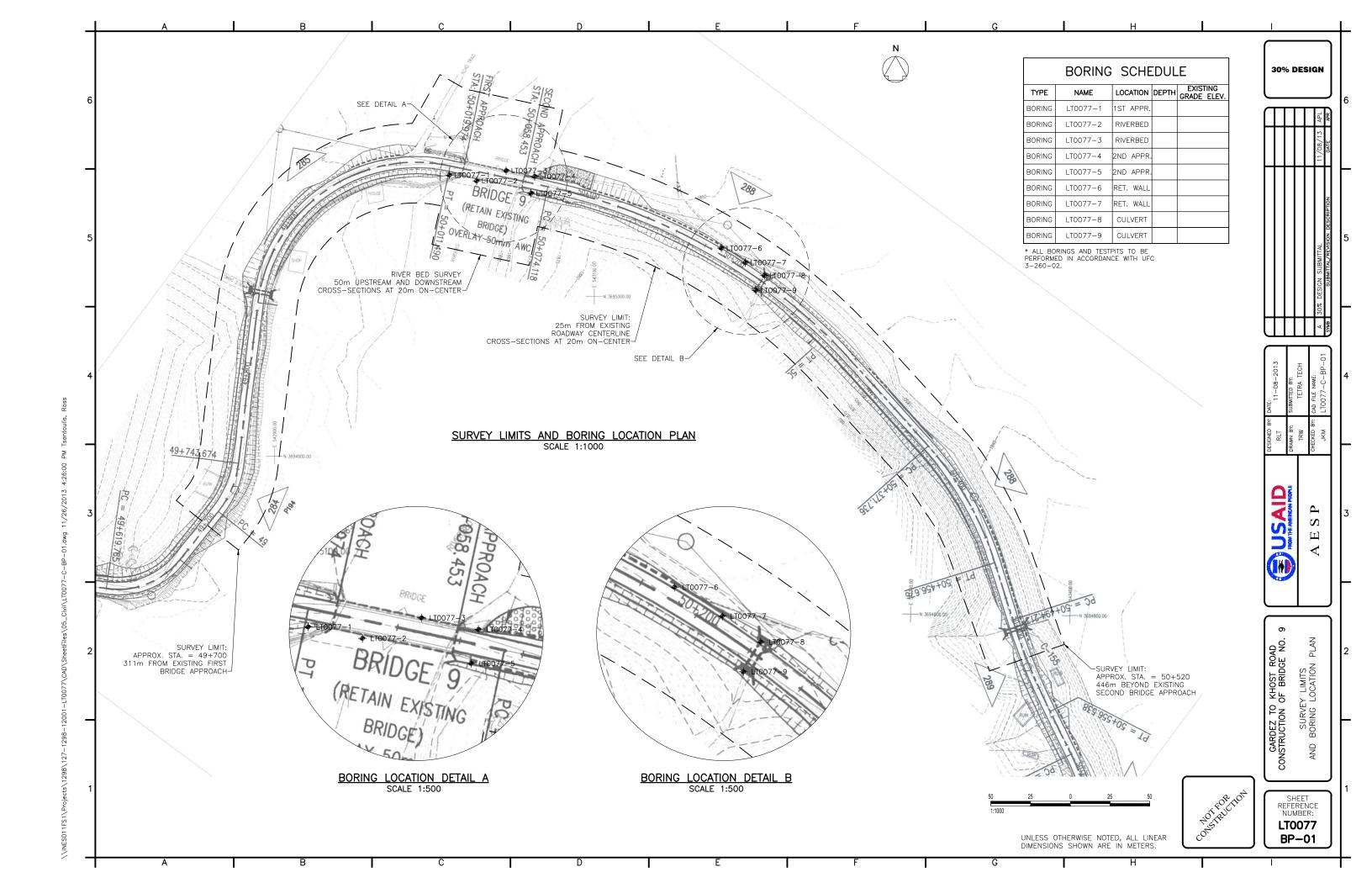
We trust that this report will assist you in the design and construction of the proposed project. KA Labs appreciates the opportunity to provide our services on this project and looks forward to working with you during construction and on future projects. Should you have any questions , please do not hesitate to contact us.

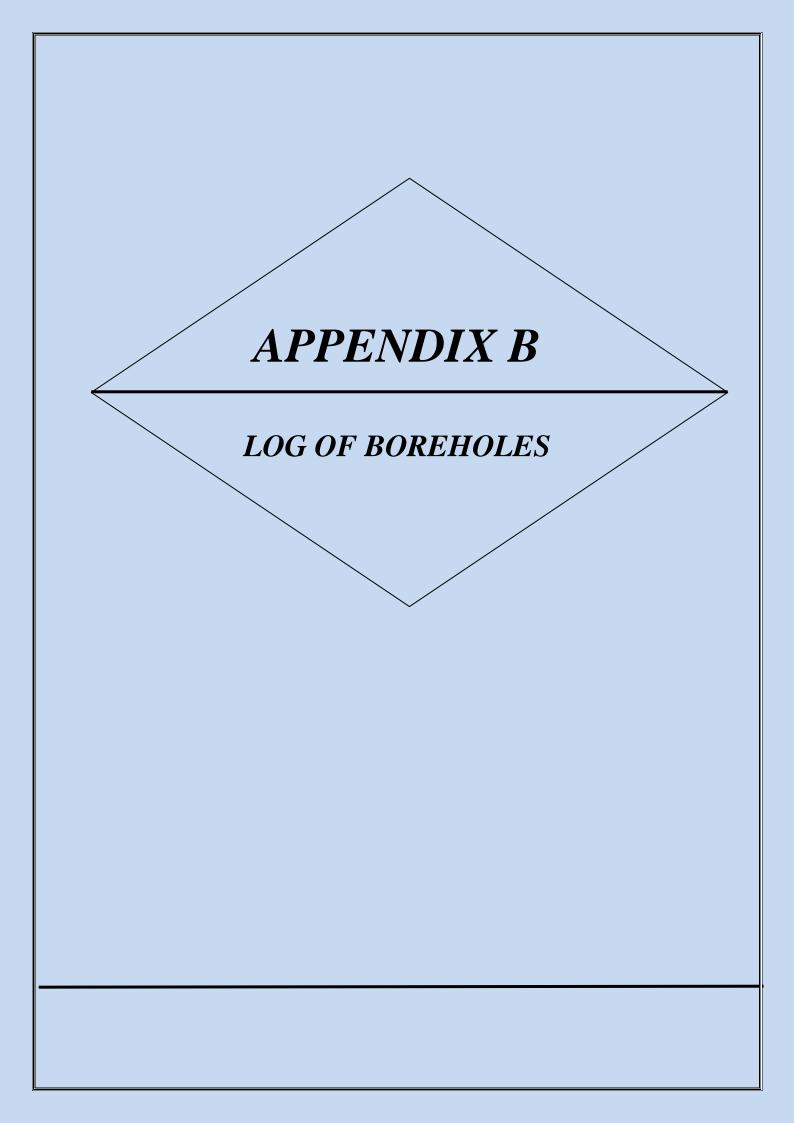
This report was prepared by KA LABS.

Respectfully submitted to

TETRA TECH







Geological Log LOG OF BH# 01 Completion Depth Of Borehole: 8 (meter) Client: USAID Location : Gardez to Khost Road Contractor. TETRA TECH. Weather: Sunny Sub-Contractor :KA. Depth: 8.00 m Project. Construction of Bridge # 09 at Gardez to Khost Road, Afghanistan CORE RECOVERY (%) USCS CLASSIFICATION Depth of SPT Test (m) **GRAPHIC LOG** DEPTH (M) MATERIAL SPT/ (N VALUE) DESCRIPTION 10 30 40 100 well Graded Gravel with Silt & Sand GW-GM 1 Refusal Well Graded Gravel GW 2 Refusal 100 well Graded Gravel with Silt & Sand GW-GN 3 Refusal Refusal 100 Well Graded Gravel with Sand GW 100 5 Refusal



100

Drilling Method : Geotechnical Rotary Core Drilling (ASTM D-2113)

Sampling Method: Continuous Soil Sampling - Split Spoon

SPT Hammer : 63.5-Kg/30 inch drop-Split Spoon via ASTM D-1586

Geotechnical Engineer

Remark...

6

GW

GW

Well Graded Gravel

Well Graded Gravel with Sand

Refusal

Refusal

Refusal

Geological Log LOG OF BH# 02 Completion Depth Of Borehole: 8 (meter)

Client:

USAID

BOREHOLE AND STORED IN WOODEN BOXES.

Geotechnical Rotary Core Drilling (ASTM D-2113)

63.5-Kg/30 inch drop-Split Spoon via ASTM D-1586

Continuous Soil Sampling - Split Spoon

Drilling Method:

SPT Hammer :
Geotechnical Engineer:

Sampling Method:

Location: Gardez to Khost Road Contractor. TETRA TECH . Weather: Sunny Sub-Contractor :KA. Depth: 8.00 m Project. Construction of Bridge # 09 at Gardez to Khost Road, Afghanistan CORE RECOVERY
(%) USCS CLASSIFICATION Depth of SPT Test (m) **GRAPHIC LOG** DEPTH (M) MATERIAL SPT/ (N VALUE) DESCRIPTION 10 30 40 100 well Graded Gravel with Silt & Sand GW-GN 1 Refusal 100 2 GW Refusal Well graded gravel with Sand 3 Refusal well Graded Gravel with Silt & Sand GW-GM Refusal 4 Well Graded Gravel with Sand GW 100 5 Refusal 6 Refusal GW-GM well Graded Gravel with Silt & Sand Refusal Well Graded Gravel with Sand GW 100 Refusal NOTE Remark... 1-CONTINUAL SOIL SAMPLE RECOVERED FROM

Geological Log LOG OF BH# 03

USAID

Client:

Completion Depth Of Borehole: 8 (meter)

Contracto	or: TETRA TECH .					Location: Gardez to Khost Road					
	actor :KA.					Weather: Sunny					
Project:		ion of	Bridge # 09 at Gardez to Khost Road, Afghanist	an	Dept	h: 8.00	m				
DЕРТН (M)	GRAPHIC LOG	CORE RECOVERY (%)	MATERIAL DESCRIPTION	USCS	Depth of SPT Test (m)	BLOW COUNTS (N VALUE)	10	S 20	PT/ (N VALU	E) 40	
1 -		100	Well Graded Gravel	GW	2	Refusal Refusal					
3 -		100	Poorly Graded Gravel	GP	3	Refusal					
4 -		100	Well Graded Gravel with Sand	GW	4	Refusal					
5 -		100	Silty Gravel with Sand	GM	5	Refusal					
6 -		100	Well Graded Gravel with Sand	GW	7	Refusal Refusal					
8		100	Well Graded Gravel	GW	8	Refusal					
NOTE					Rema	rk					
			E RECOVERED FROM IN WOODEN BOXES.								

Geotechnical Rotary Core Drilling (ASTM D-2113)

63.5-Kg/30 inch drop-Split Spoon via ASTM D-1586

Continuous Soil Sampling - Split Spoon

Drilling Method : Sampling Method :

SPT Hammer :
Geotechnical Engineer:

Geological Log

Sampling Method:

SPT Hammer :
Geotechnical Engineer:

Continuous Soil Sampling - Split Spoon

63.5-Kg/30 inch drop-Split Spoon via ASTM D-1586

LOG OF BH# 04

Completion Depth Of Borehole: 8 (meter)

Client:	USAID					tion . Coul	t- Vb	. Dl				
Contractor: TETRA TECH .						Location: Gardez to Khost Road Weather: Sunny						
	tractor :KA.		Depth: 8.00 m									
Project:	Construct		Bridge # 09 at Gardez to Khost Road, Afghanist									
DЕРТН (M)	GRAPHIC LOG	CORE RECOVERY (%)	MATERIAL DESCRIPTION	USCS	Depth of SPT Test (m)	BLOW COUNTS (N VALUE)	1	0	SPT.	/ (N VALUI 30	E) 40	
1 -		100	well Graded Gravel with Silt & Sand	GW-GN	1	Refusal						
		100	Silty Sand with Gravel	SM								
2 -		100			2	Refusal						
3 -		100	well Graded Gravel with Silt & Sand	GW-GN	3	Refusal						
4 -		100			4	Refusal						
5 –		100		_	5	Refusal						
6 -		100	Silty Gravel with Sand	GM	6	Refusal						
7 -		100	well Graded Gravel with Silt & Sand	GW-GN	7	Refusal						
8		100	Silty Gravel with Sand	GM	8	Refusal						
NOTE	- * * * * *				Rema				•			
1-CONT	INUAL SOILSA		RECOVERED FROM IN WOODEN BOXES.		rema	IK						
			chnical Rotary Core Drilling (ASTM D-2113)									

Geological Log

Sampling Method:

SPT Hammer :
Geotechnical Engineer:

Continuous Soil Sampling - Split Spoon

63.5-Kg/30 inch drop-Split Spoon via ASTM D-1586

Client:

LOG OF BH# 05

USAID

Completion Depth Of Borehole: 8 (meter)

Contractor: TETRA TECH .					Location : Gardez to Khost Road					
Sub-Contractor :KA. Project: Construction of Bridge # 09 at Gardez to Khost Road, Afghanistan					Weather: Sunny Depth: 8.00 m					
Project C		Bridge # 09 at Gardez to Khost Road, Afghanis								
DEPTH (M) GRAPHIC LOG	CORE RECOVERY	MATERIAL DESCRIPTION	USCS CLASSIFICATION	Depth of SPT Test (m)	BLOW COUNTS (N VALUE)	10	SI 20	PT/ (N VALU 30	E) 40	
1 -	100	well Graded Gravel with Silt & Sand	GW-GM	1	Refusal					
	100	Silty Gravel with Sand	GM							
2 -	100	well Graded Gravel with Silt & Sand	GW-GM	2	Refusal					
3 - 77	100	Silty Gravel with Sand	GM	3	Refusal					
4 - 0	100			4	Refusal					
5 –	100	well Graded Gravel with Silt & Sand	GW-GM	5	Refusal					
6 –				6	Refusal					
7 - 0	100	Well Graded Gravel	GW	7	Refusal					
	100	Silty Gravel with Sand	GM	8	Refusal					
NOTE				Rema	rk					
		E RECOVERED FROM IN WOODEN BOXES.								
Drilling Method	Geote	chnical Rotary Core Drilling (ASTM D-2113)								

Geological Log

Drilling Method:

SPT Hammer:

Sampling Method:

Geotechnical Engineer

Geotechnical Rotary Core Drilling (ASTM D-2113)

63.5-Kg/30 inch drop-Split Spoon via ASTM D-1586

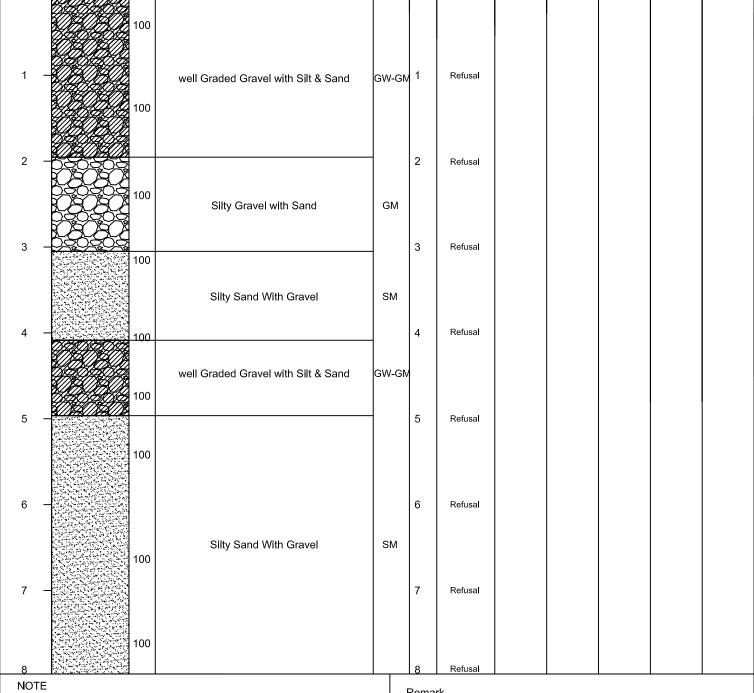
Continuous Soil Sampling - Split Spoon

LOG OF BH# 06

Completion Depth Of Borehole: 8 (meter)

Client: USAID Location: Gardez to Khost Road Contractor. TETRA TECH . Weather: Sunny Sub-Contractor :KA. Depth: 8.00 m Project. Construction of Bridge # 09 at Gardez to Khost Road, Afghanistan CORE RECOVERY
(%) USCS CLASSIFICATION Depth of SPT Test (m) **GRAPHIC LOG** DEPTH (M) MATERIAL SPT/ (N VALUE) DESCRIPTION 10 30 40 100 well Graded Gravel with Silt & Sand GW-GN 1 Refusal 100 GC-GM Silty Clayey Gravel with Sand 2 Refusal Silty Gravel with Sand GM 3 Refusal Refusal 4 100 sw-sm Well Graded Sand with Silty & Gavel 100 5 5 Refusal 100 Silty Sand with Gravel SM 6 6 Refusal Silty Gravel with Sand GM Refusal Silty Sand with Gravel SM 100 Refusal NOTE Remark... 1-CONTINUAL SOIL SAMPLE RECOVERED FROM BOREHOLE AND STORED IN WOODEN BOXES.

Geological Log LOG OF BH# 07 Completion Depth Of Borehole: 8 (meter) Client: USAID Location : Gardez to Khost Road Contractor. TETRA TECH . Weather: Sunny Sub-Contractor :KA. Depth: 8.00 m Project. Construction of Bridge # 09 at Gardez to Khost Road, Afghanistan USCS CLASSIFICATION Depth of SPT Test (m) CORE RECOVERY **GRAPHIC LOG** DEPTH (M) MATERIAL SPT/ (N VALUE) DESCRIPTION 10 30 40 100 GW-GM Refusal well Graded Gravel with Silt & Sand 100 2 Refusal Silty Gravel with Sand GM 3 Refusal 100



1-CONTINUAL SOIL SAMPLE RECOVERED FROM BOREHOLE AND STORED IN WOODEN BOXES.

Drilling Method: Geotechnical Rotary Core Drilling (ASTM D-2113)

Sampling Method:

Continuous Soil Sampling - Split Spoon

63.5-Kg/30 inch drop-Split Spoon via ASTM D-1586 SPT Hammer: Geotechnical Engineer: E

Remark...

Geological Log LOG OF BH# 08 Completion Depth Of Borehole: 8 (meter) Client: USAID Contractor: TETRA TECH. Location: Gardez to Khost Road Weather: Supply

Contractor: TETRA TECH . Sub-Contractor :KA.					Wea	ther: Sunr	ny				
Project:		ion of	Bridge # 09 at Gardez to Khost Road, Afghanista	an	Dept	h: 8.00	m				
DEPTH (M)	GRAPHIC LOG	CORE RECOVERY (%)	MATERIAL DESCRIPTION	USCS	Depth of SPT Test (m)	BLOW COUNTS (N VALUE)	10	SPT/ (N VALUE) 0 20 30 40			
1 -		100	Silty Sand with Gravel	SM	1	Refusal					
2 -		100	Silty Clayey Sand with Gravel	SC-SM	2	Refusal					
4 -		100	Silty Gravel with Sand	GM	4	Refusal Refusal					
5 -		100	Sandy Silty Clay	CL-ML	5	Refusal					
6 -		100	Silty Gravel with Sand	GM	6	4-5-7-(12)		0			
7 -		100	Rock		7	Refusal Refusal					
NOTE					Rema						

1-CONTINUAL SOIL SAMPLE RECOVERED FROM

BOREHOLE AND STORED IN WOODEN BOXES.

Drilling Method: Geotechnical Rotary Core Drilling (ASTM D-2113)

Sampling Method : Continuous Soil Sampling - Split Spoon

SPT Hammer: 63.5-Kg/30 inch drop-Split Spoon via ASTM D-1586

Geotechnical Engineer:

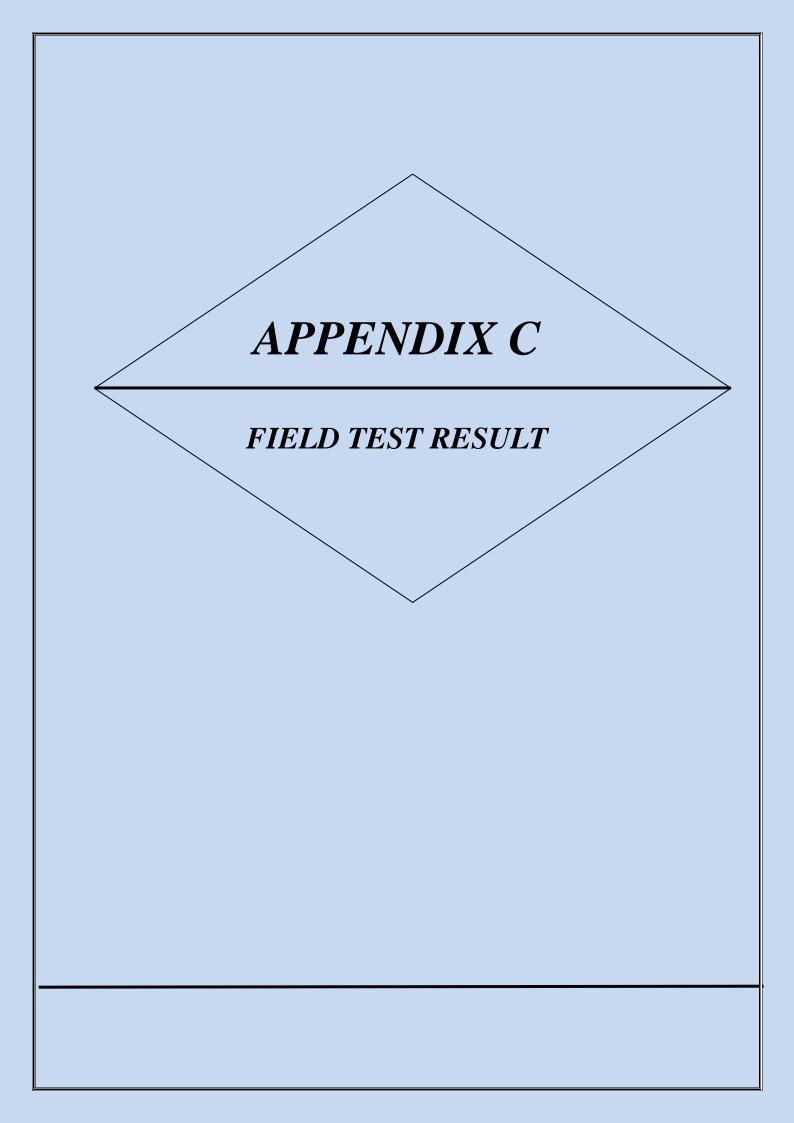
Remark...

Geological Log LOG OF BH# 09 Completion Depth Of Borehole: 8 (meter) Client : USAID Location: Gardez to Khost Road Contractor. TETRA TECH . Weather. Sunny Sub-Contractor :KA. Depth: 8.00 m Project. Construction of Bridge # 09 at Gardez to Khost Road, Afghanistan CORE RECOVERY (%) USCS CLASSIFICATION Depth of SPT Test (m) **GRAPHIC LOG** BLOW COUNTS (N VALUE) DEPTH (M) MATERIAL SPT/ (N VALUE) DESCRIPTION 10 30 40 100 Silty Sand with Gravel SM 6-7-9-(16) 1 100 Silty Clay with Sand CL-ML 2 3-6-7-(13) 100 Silty Clayey Gravel with Sand GC-GM 3 4-7-8-(15) 100 6-8-7-(15) 100 Sandy Silty Clay CL-ML 100 5 5 7-8-9-(17) 100 SM Silty Sand with Gravel 6 6 8-11-12-(23) 10-12-12-(24) GM Silty Gravel with Sand 10-11-13-(24) NOTE Remark... 1-CONTINUAL SOIL SAMPLE RECOVERED FROM BOREHOLE AND STORED IN WOODEN BOXES.

Drilling Method: Sampling Method: Geotechnical Rotary Core Drilling (ASTM D-2113)

Continuous Soil Sampling - Split Spoon

SPT Hammer: 63.5-Kg/30 inch drop-Split Spoon via ASTM D-1586 Geotechnical Enginee





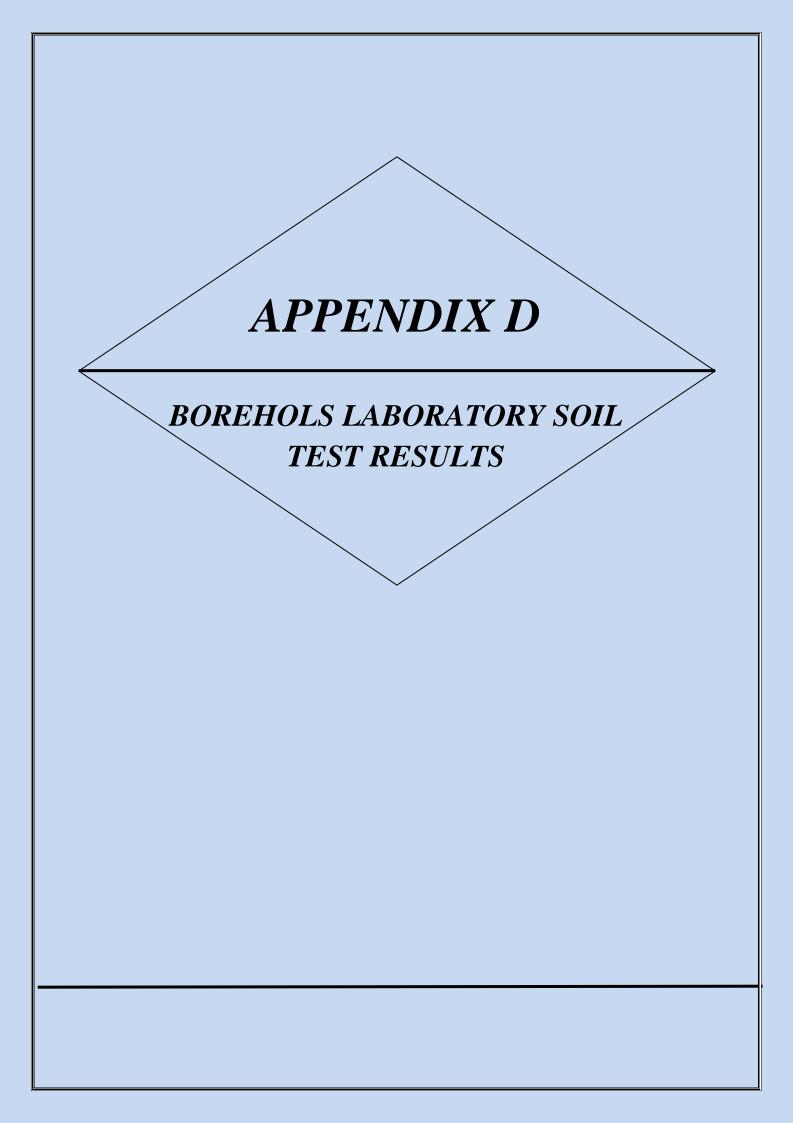
Behind of Rehman Baba College Mirwais Maidan Kote Sangi Kabul/Afghanistan

Projec Chain Mater	ct Name :	Totas Toch				<i>)</i>	O T - 191	
Chain Mater		retra rech	Construc	tion Company			Job No.	KA-Geo-127
Mater				ge # 09 at Gard	ez to Khost Roa	ad	Testing Date :	1/13/2014
	U	Test Pit Ne		ole # 06			Rep. Date :	1/19/2014
t d	rial:	Existing So	il				Depth Meters :	0.6
Data	ield Test No.			1				
Gen. I	est Location			Near B.H-6				
ğ D	epth of Hole		Cms	60				
W	/t. of Wet Soi	l + Cont.	gms	7611				
W	t. of Cont.		gms	10				
W	/t. of Wet Soi	1	gms	7601				
	ia of Cone		Cms	15				
In Re	nitial Wt. of S	and+Cont.	gms	8000				
Rí	esidual Wt. o	of Sand+Con	t gms	1326				
	t. of Used Sa	and	gms	6674				
FIELD I	It. of Sand to	Fill Cone	gms	1851				
	It. of Sand to	Fill Hole	gms	4823				
U	nit Wt. of Sa	nd	g/Cm ³	1.404				
V	olume of Ho	le	Cm ³	3435.19				
W	let Density		g/Cm ³	2.213				
⊢ Ci	an No.						n.	
E W	It. of Can		gms					
N N	It. of Can+W	et Soil	gms				speed!	
С W	/t. of Can+ D	ry Soil	gms		styre			
l in w	t. of Water		gms		Sterr			
MOISTURE CONTENT	/t. of Dry Soi	1	gms	1000				
≥ M	Ioisture Cont	tent	%	7.6				
D	ry Density		g/Cm ³	2.056				
∑М	laximum Dry	Density	g/cm ³	2.185				
M O	o.M.C		%	6.3				
RESI	ompaction C	btained	%	94.1				
C	ompaction R	equired	%					



Behind of Rehman Baba College Mirwais Maidan Kote Sangi Kabul/Afghanistan

		FIELI	D DENS	ITY TEST AS	51M D - 1550	6 / AASH	TO T - 191	
Cli	ent Name :	Tetra Tech	Construc	tion Company			Job No.	KA-Geo-127
Pro	ject Name :	Constructi	on of Brid	ge # 09 at Gard	ez to Khost Ro	ad	Testing Date :	1/13/2014
Cha	inage :	Test Pit Ne	ear Bore H	lole # 08			Rep. Date :	1/19/2014
Ma	terial :	Existing So	oil				Depth Meters :	0.5
ata	Field Test No.			1				
Gen. Data	Test Location	:		Near B.H-8				
Ge	Depth of Hole	9	Cms	50				
	Wt. of Wet So	il + Cont.	gms	5750				
	Wt. of Cont.		gms	10				
	Wt. of Wet So	il	gms	5740				
	Dia of Cone		Cms	15				
ĬΤ	Initial Wt. of S	Sand+Cont.	gms	8000				
FIELD DENSITY	Residual Wt.	of Sand+Con	ıt gms	2320				
	Wt. of Used S	and	gms	5680				
	Wt. of Sand to	Fill Cone	gms	1851				
	Wt. of Sand to	Fill Hole	gms	3829				
	Unit Wt. of Sa	ınd	g/Cm ³	1.404				
	Volume of Ho	ole	Cm ³	2727.21				
	Wet Density		g/Cm ³	2.105				
_	Can No.						1	
	Wt. of Can		gms				Speed!	
NO	Wt. of Can+W	et Soil	gms			RI	5050	
MOISTURE CONTENT	Wt. of Can+ D	ry Soil	gms		styre	DY		
ĮΞ̈́	Wt. of Water		gms	-MO	Sterr			
SIOI	Wt. of Dry So	il	gms	lane				
2	Moisture Con	tent	%	7.3				
	Dry Density		g/Cm ³	1.962				
JLTS	Maximum Dr	y Density	g/cm ³	2.143				
SIL	O.M.C		%	6.9				
RESL	Compaction (Obtained	%	91.5				
	Compaction I	Required	%					





Behind of Rahman Baba Collage Mirwise Maidan Kotai Sangi Kabul Afghanistan

		Delillia of F		Sun													
Client Name :	Tetra Tech Construction Company									Date	:				1/	21/2014	
Project Name:	Construction of Bridge # 09 at Gar	dez to Khos	st Roa	ad						Job N	lo:				KA	-Geo-12	27
Location:	Bore Hole # 01 (8 Meters)									Samp	led By	/:			k	KA Rep	
Borehole Coordinate	X-542985 Y-3693583									Eleva	tion (r	n)			1	1855	
Depth (m)	Soil Group Name	Group Symbol	Total Depth (m)		N Value	Boulder % age in Total Sample From (8" ~ 3")	G	radatio	on of S	Soil fro	om 3" I	Down :	Materi	ials	N.M.C %	Plastic Index	Remarks
Dept	Ground Surface	Grou	Tota	SPT	Z	Bou Tota Fror	3"	2"	1	1/2"	#4	#10	#40	#200	N.N.	Plasi	Rem
	well Graded Gravel with Silt & Sand	GW-GM		SPT-1	N.A	Nil	100	100	74.2	52.2	37.5	25.6	14.1	5.9		N.P	
	Well Graded Gravel	GW		SPT-2	N.A	20.2%	100	76.1	38.9	27.5	18.0	12.2	7.2	3.3		N.P	də
	well graded Gravel with Silt & Sand	GW-GM	08 Meter Bore Hole	SPT-3	N.A	Nil	100	74.1	48.6	36.0	25.4	17.8	10.2	5.7		N.P	e 0.6 Meter De
	well Graded Gravel with Sand	GW	08 Met	SPT-4	N.A	Nil	100	86.7	52.3	37.5	28.5	22.0	10.3	3.9	Full Saturated Materials	N.P	round Surface
	Well Graded Gravel with Sand	GW		SPT-5	N.A	Nil	100	69.6	46.5	30.8	17.7	9.5	4.6	1.7	Full Saturat	N.P	Water Lavel from Ground Surface 0.6 Meter Deep
	Well Graded Gravel	GW		SPT-6	N.A	Nil	100	76.8	54.8	23.5	12.4	9.2	6.5	3.0		N.P	Wate
	Well Graded Gravel	GW		SPT-7	N.A	Nil	100	76.9	52.4	26.0	17.2	13.7	10.0	4.7	-	N.P	
	Well Graded Gravel with Sand	GW		SPT-8	N.A	25.0%	100	93.7	69.6	48.9	32.3	23.5	14.1	7.6		N.P	
	w;	_	ı		1	<u>, </u>	ı	ı	ı	ı	ı	ı	1		1	1	
	Tested By													Lab	Mai	nager	(Q.C)



Behind of Rahman Baba Collage Mirwise Maidan Kotai Sangi Kabul Afghanistan

					mm	ary											
Client Name :	Tetra Tech Construction Company	7								Date :					1/2	1/2014	
Project Name :	Construction of Bridge # 09 at Gar	rdez to Kho	ost R	oad						Job N	o :				KA-	Geo-12	7
Location:	Bore Hole # 02 (8 Meters)									Sampl	led By	:			K	A Rep	
Borehole Coordinate	X-543011 Y-3693574									Elevat	ion (m)				1853	
Depth (m)	Soil Group Name	Group Symbol	Total Depth (m)	SPT	N Value	Boulder % age in Total Sample From $(8" \sim 3")$	3"	2"	1"	radatio	on of So	oil #10	#40	#200	N.M.C %	Plastic Index	Remarks
П	Ground Surface	O	L	S	Z	шгг	3		1	1,	#4	#10	#40	#200	Z	Д	R
	Well graded gravel with Silt and Sand	GW-GM		SPT-1	N.A	Nil	100	82.4	60.4	46.1	33.4	22.6	13.4	5.7		N.P	
	Well graded gravel with Sand	GW		SPT-2	N.A	Nil	100	68.5	52.4	34.2	22.7	15.2	8.4	3.5		N.P	d
	Well graded gravel with Sand	GW	08 Meter Bore Hole	SPT-3	N.A	Nil	100	61.5	41.8	27.2	18.2	11.9	6.2	3.2		N.P	0.4 Meter Dee
	Well graded gravel with Silt and Sand	GW-GM	08 Meter J	SPT-4	N.A	32.7	100	90.7	79.3	58.6	38.9	25.3	13.5	6.7	Full Saturated Materials	N.P	Water Lavel from Ground Surface 0.4 Meter Deep
	Well graded gravel with Sand	GW		SPT-5	N.A	18.5	100.0	79.2	51.6	34.8	23.6	15.2	7.5	3.1	Full Saturat	N.P	er Lavel from G
	Well graded gravel with Silt and Sand	GW-GM		SPT-6	N.A	19.5	100	96.8	68.6	51.4	35.9	24.0	14.1	5.9		N.P	Wate
	Well graded gravel with Silt and Sand	GW-GM		SPT-7	N.A	21.4	100	93.2	70.2	48.0	34.8	27.4	18.7	8.6		N.P	
	Well graded Gravel with Sand	GW		SPT-8	N.A	Nil	100	79.4	54.9	37.4	22.8	15.1	9.0	4.2		N.P	
7	7			SPT-8			100	79.4	54.9	37.4	22.8	15.1	9.0	4.2 Lab	Man		N.P



Behind of Rahman Baba Collage Mirwise Maidan Kotai Sangi Kabul Afghanistan

				S11	mma	arv											
Client Name :	Tetra Tech Construction Company			Su	1111116	лг у				Date :					1/2	1/2014	
Project Name :	Construction of Bridge # 09 at Gar		st Ro	ad						Job N						Geo-12'	
Location:	Bore Hole # 03 (8 Meters)	dez to mio	St Ito	uu							ed By :					A Rep	,
Borehole Coordinate	X-543020 Y-3693607										ion (m)					.858	
Depth (m)	Soil Group Name	Group Symbol	Total Depth (m)	SPT	N Value	Boulder % age in Total Sample From $(8" \sim 3")$	3"	2"	1"		on of So #4	oil #10	#40	#200	N.M.C %	Plastic Index	Remarks
	Ground Surface	1	1		1						l	l	l	l	l	1	
	Well Graded Gravel	GW		SPT-1	N.A	Nil	100	72.7	38.7	18.2	10.0	6.9	3.8	1.0		N.P	
	Well Graded Gravel	GW		SPT-2	N.A	Nil	100	78.4	35.5	15.8	8.6	4.9	2.3	0.3		N.P	dz
	Well Graded Gravel	GW	08 Meter Bore Hole	SPT-3	N.A	Nil	100	64.8	27.4	14.1	8.3	5.3	3.1	0.7		N.P	9.35 Meter Dec
	Poorly Graded Gravel	GP	08 Mete	SPT-4	N.A	Nil	100	80.6	33.1	12.1	4.6	2.9	1.9	1.1	d Materials	N.P	ound Surface
	Well Graded Gravel with Sand	GW		SPT-5	N.A	23.9%	100	75.1	52.3	36.1	24.1	15.4	8.1	2.0	Full Saturated Materials	N.P	Water Lavel from Ground Surface 0.35 Meter Deep
	Silty Gravel with Sand	GM		SPT-6	N.A	Nil	100	66.4	55.7	42.8	38.7	35.3	24.6	16.3		N.P	Water
	Well Graded Gravel with Sand	GW		SPT-7	N.A	Nil	100	66	48.2	26.0	17.4	11.2	5.8	1.2		N.P	
	Well Graded Gravel	GW		SPT-8	N.A	Nil	100	67.1	42.5	21.6	9.9	5.6	3.6	0.8		N.P	

Lab Manager (Q.C)



Behind of Rahman Baba Collage Mirwise Maidan Kotai Sangi Kabul Afghanistan

				Su	mma	ary											
Client Name :	Tetra Tech Construction Company	,				•				Date :					1/2	1/2014	
Project Name :	Construction of Bridge # 09 at Gar		st Ro	ad						Job N	o :				KA-	Geo-12'	7
Location:	Bore Hole # 04 (8 Meters)										ed By :				K	A Rep	
Borehole Coordinate	X-543040 Y-3693600									Elevat	ion (m))			1	859	
Depth (m)	Soil Group Name	Group Symbol	Total Depth (m)	SPT	N Value	Boulder % age in Total Sample From $(8" \sim 3")$	3"	2"	1"		on of So #4	oil #10	#40	#200	N.M.C %	Plastic Index	Remarks
	Ground Surface			I		ı	ı	I	ı		I	I	ı				
	Well Graded Gravel with Silt & Sand	GW-GM		SPT-1	N.A	Nil	100	78.0	44.6	36.7	32.7	29.6	18.7	8.9		N.P	
	Silty Sand with Gravel	SM	lole	SPT-2	N.A	28.5%	100	100	86.8	73.3	66.1	59.6	41.6	19.5		N.P	di
	Well Graded Gravel with Silt & Sand	GW-GM	Meter Bore Hole	SPT-3	N.A	Nil	100	72.1	42.1	38.6	33.5	29.5	19.9	9.8		N.P	3.45 Meter Dea
	Well Graded Gravel with Silt & Sand	GW-GM	08 Met	SPT-4	N.A	42.5%	100	70.8	45.3	39.7	35.1	30.6	19.7	10.9	Full Saturated Materials	N.P	ound Surface
	Well Graded Gravel with Silt & Sand	GW-GM		SPT-5	N.A	24.7%	100	70.4	48.9	44.0	39.8	36.1	19.2	11.1	Full Saturate	N.P	Nater Lavel from Ground Surface 3.45 Meter Deep
	Silty Gravel with Sand	GM		SPT-6	N.A	Nil	100	87.5	54.5	42.1	34.9	29.6	21.6	12.6		N.P	Water
	Well Graded Gravel with Silt & Sand	GW-GM		SPT-7	N.A	22.8%	100	59.8	49.3	33.6	27.8	23.6	18.1	9.0		N.P	
	Silty Gravel with Sand	GM		SPT-8	N.A	37.6%	100	100	73.8	57.2	46.2	38.9	27.6	15.9		N.P	

Lab Manager (Q.C)



Behind of Rahman Baba Collage Mirwise Maidan Kotai Sangi Kabul Afghanistan

				Su	mm	ary											
Client Name :	Tetra Tech Construction Company	/				•				Date :					1/2	1/2014	
Project Name :	Construction of Bridge # 09 at Ga		st Ro	ad						Job N						Geo-127	7
Location:	Bore Hole # 05 (8 Meters)									Samp	ed By :				K	A Rep	
Borehole Coordinate	X-543032 Y-3693587	_		•	1	1				Elevat	ion (m))			1	858	
Depth (m)	Soil Group Name	Group Symbol	Total Depth (m)	SPT	N Value	Boulder % age in Total Sample From $(8" \sim 3")$	3"	2"	1"	Fradatio	on of So	oil #10	#40	#200	N.M.C %	Plastic Index	Remarks
	Ground Surface	1 0	L	S	Z	шГц	3		1	1,	#4	#10	#40	#200		Ъ	R
	Well Graded Gravel with Silt & Sand	GW-GM		SPT-1	N.A	26.9%	100	60.4	49.5	41.3	34.3	28.7	21.0	9.8		N.P	
	Silty Gravel with Sand	GM		SPT-2	N.A	38.3%	100	86.1	57.5	53.4	50.1	45.3	29.2	17.8		N.P	də
	Well Graded Gravel with Silt & Sand	GW-GM	08 Meter Bore Hole	SPT-3	N.A	Nil	100	63.5	44.1	37.0	32.5	28.8	17.0	9.2		N.P	3.50 Meter De
	Silty Gravel with Sand	GM	08 Met	SPT-4	N.A	Nil	100	66.0	50.5	43.9	38.7	35.0	26.5	13.3	Full Saturated Materials	N.P	ound Surface
	Well Graded Gravel with Silt & Sand	GW-GM		SPT-5	N.A	Nil	100	66.0	38.2	34.4	32.0	29.8	20.9	11.1	Full Saturate	N.P	Water Lavel from Ground Surface 3.50 Meter Deep
	Well Graded Gravel with Silt & Sand	GW-GM		SPT-6	N.A	Nil	100	93.9	58.8	46.9	38.7	32.7	19.4	11.7		N.P	Water
	Well Graded Gravel	GW		SPT-7	N.A	Nil	100	73.7	50.2	22.1	13.5	9.9	7.7	2.2		N.P	
	Silty Gravel with Sand	GM		SPT-8	N.A	24.30%	100	84.6	79.8	50.5	42.8	36.3	27.6	14.5		N.P	

Lab Manager (Q.C)



Behind of Rahman Baba Collage Mirwise Maidan Kotai Sangi Kabul Afghanistan

Client Name :				~ ~	mma												
CHOIL FAITHC.	Tetra Tech Construction Company					J				Date :					1/21	1/2014	
Project Name :	Construction of Bridge # 09 at Gar		st Ro	ad						Job No) ·					Geo-12	7
Location:	Bore Hole # 06 (8 Meters)	dez to itho	3t 1to								ed By :					A Rep	,
Borehole Coordinate	X-543090 Y-3693581										ion (m)					851	
Depth (m)	Soil Group Name	Group Symbol	Total Depth (m)	SPT	N Value	Boulder % age in Total Sample From $(8" \sim 3")$	3"	2"	G 1"	Fradatio			#40	#200	N.M.C %	Plastic Index	Remarks
	Ground Surface				ı			1	1	ı			1				
1	Well Graded Gravel with Silt & Sand	GW-GM		SPT-1	N.A	32.7%	100	77.2	70.0	55.6	43.8	30.6	17.8	9.4	7.2	N.P	
2	Silty Clayey Gravel with Sand	GC-GM		SPT-2	N.A	25.5%	100	100.0	87.7	74.4	63.3	49.4	36.4	29.4	7.5	N.P	d
3	Silty Gravel with Sand	GM	Meter Bore Hole	SPT-3	N.A	Nil	100	84.2	76.2	63.0	49.0	35.7	23.3	13.6	7.1	N.P	5.15 Meter Dee
4	Silty Gravel with Sand	GM	08 Mete	SPT-4	N.A	Nil	100	80.3	70.2	58.6	47.1	34.1	21.1	13.4	7.1	N.P	ound Surface
5	Well Graded Sand with Silty & Gavel	SW-SM		SPT-5	N.A	Nil	100	79.6	77.3	72.3	61.1	40.0	19.5	11.8	6.0	N.P	Water Lavel from Ground Surface 5.15 Meter Deep
6	Silty Sand with Gravel	SM		SPT-6	N.A	Nil	100	90.7	87.1	80.6	66.7	44.3	22.5	14.0	6.9	N.P	Water
7	Silty Gravel with Sand	GM		SPT-7	N.A	Nil	100	93.2	84.6	69.9	40.4	21.6	16.1	12.7	6.3	N.P	
8	Silty Sand with Gravel	SM		SPT-8	N.A	Nil	100	92.8	76.6	68.3	57.5	38.6	22.1	14.4	7.8	N.P	

Lab Manager (Q.C)



Behind of Rahman Baba Collage Mirwise Maidan Kotai Sangi Kabul Afghanistan

				C11	mma	9 1°3 7											
Client Name :	Tetra Tech Construction Company	,		Su	1111116	ai y				Date :					1/2	1/2014	
Project Name :	Construction of Bridge # 09 at Gar		et Ro	ad						Job N						Geo-12	7
Location:	Bore Hole # 07 (8 Meters)	Idez to Kno.	st Ko	au							led By					A Rep	,
Borehole Coordinate	X-543132 Y-3693570										tion (m					855	
Depth (m)	Soil Group Name	Group Symbol	Total Depth (m)	SPT	N Value	Boulder % age in Total Sample From $(8" \sim 3")$	3"	2"	1"	•	on of So		#40	#200	N.M.C %	Plastic Index	Remarks
	Ground Surface		ı	I		I		ı	ı			1	1	ı	1	1	
	Well Graded Gravel with Silt & Sand	GW-GM		SPT-1	N.A	21.1%	100	77.2	65.1	51.9	41.1	28.4	16.4	9.3	<i>4.7</i>	N.P	
	Well Graded Gravel with Silt & Sand	GW-GM		SPT-2	N.A	Nil	100	81.4	69.5	54.1	42.7	29.9	15.3	11.9	6.1	N.P	di
	Silty Gravel with Sand	GM	08 Meter Bore Hole	SPT-3	N.A	Nil	100	93.8	70.3	61.6	48.2	35.0	22.4	14.6	6.9	N.P	5.35 Meter Dec
	Silty Sand With Gravel	SM	08 Mete	SPT-4	N.A	Nil	100	90.4	85.7	73.2	57.6	40.8	24.5	14.4	6.5	N.P	ound Surface
	Well Graded Gravel with Silt & Sand	GW-GM		SPT-5	N.A	Nil	100	78.7	69.8	65.6	55.2	36.3	18.1	11.2	8.2	N.P	Water Lavel from Ground Surface 5.35 Meter Deep
	Silty Sand with Gravel	SM		SPT-6	N.A	Nil	100	100	86.6	77.2	64.1	42.1	20.9	12.9	7.0	N.P	Water
	Silty Sand with Gravel	SM		SPT-7	N.A	Nil	100	88.3	83.2	78.3	64.8	44.4	22.2	12.6	8.9	N.P	
	Silty Sand with Gravel	SM		SPT-8	N.A	Nil	100	100	86.0	77.3	61.8	43.4	23.0	13.7	6.9	N.P	

Lab Manager (Q.C)



Behind of Rahman Baba Collage Mirwise Maidan Kotai Sangi Kabul Afghanistan

		Behind of		Su	mma	arv											
Client Name :	Tetra Tech Construction Company	v		200		<i></i>				Date :					1/2	1/2014	
Project Name :	Construction of Bridge # 09 at Ga		st Ro	ad						Job No						Geo-12'	7
Location:	Bore Hole # 08 (8 Meters)										ed By :	:				A Rep	
Borehole Coordinate	X-543202 Y-3693527										ion (m)					860	
Depth (m)	Soil Group Name	Group Symbol	Total Depth (m)	SPT	N Value	Boulder % age in Total Sample From $(8" \sim 3")$	3"	2"	1"	Fradatio	on of So	oil #10	#40	#200	N.M.C %	Plastic Index	Remarks
	Ground Surface					1		1			1	1	1	1			
	Silty Sand with Gravel	SM		SPT-1	N.A	Nil	100	100	88.8	73.6	59.5	44.0	28.4	18.5	7.1	N.P	
	Silty Sand with Gravel	SM		SPT-2	N.A	Nil	100	100	94.7	86.6	72.1	55.2	36.4	23.7	6.4	N.P	di
	Silty Clayey Sand with Gravel	SC-SM	08 Meter Bore Hole	SPT-3	N.A	Nil	100	100	94.0	83.2	73.5	59.1	43.9	34.1	L'S	5.7	5.3 Meter Dee
	Silty Gravel with Sand	GM	08 Met	SPT-4	N.A	Nil	100	58.8	40.2	34.1	29.3	24.5	18.9	13.9	6.0	N.P	round Surface
	Silty Gravel with Sand	GM		SPT-5	N.A	Nil	100	60.0	53.6	47.5	45.6	43.8	37.1	27.5	12.6	N.P	Water Lavel from Ground Surface 5.3 Meter Deep
	Sandy Silty Clay	CL-ML		SPT-6	12	Nil	100	100	100.0	99.0	95.5	90.9	75.0	55.9	13.3	6.2	Wate
	Silty Gravel with Sand	GM		SPT-7	N.A	Nil	100	65.7	47.5	45.3	44.4	43.3	38.1	29.4	7.9	N.P	
	Rock 8			Compre	essive S	Strength (M	Ipa) =	59.3 N	Мра	•		•	•				

Lab Manager (Q.C)



Behind of Rahman Baba Collage Mirwise Maidan Kotai Sangi Kabul Afghanistan

				Su	mm	ary											
Client Name :	Tetra Tech Construction Company	y				<i></i>				Date :					1/2	1/2014	
Project Name :	Construction of Bridge # 09 at Ga		st Ro	ad						Job No	o :					Geo-12	7
Location:	Bore Hole # 09 (8 Meters)									Sampl	ed By :				K	A Rep	
Borehole Coordinate	X-543190 Y-3693519	_		1	1		1			Elevat	ion (m))			1	848	
Depth (m)	Soil Group Name	Group Symbol	Total Depth (m)	SPT	N Value	Boulder % age in Total Sample From $(8" \sim 3")$	3"	2"	1"	radatio	on of So	oil #10	#40	#200	N.M.C %	Plastic Index	Remarks
	Ground Surface			1		,	ı	1	ı	1		ı	1	ı		1	
	Silty Sand with Gravel	SM		SPT-1	16	Nil	100	100	90.2	82.9	65.9	51.9	39.1	28.4	15.5	N.P	
	Silty Clay with Sand	CL-ML		SPT-2	13	Nil	100	100	98.0	94.1	91.5	87.6	80.0	70.2	18.9	6.5	a.
	Silty Clayey Gravel with Sand	GC-GM	08 Meter Bore Hole	SPT-3	15	Nil	100	90.7	82.3	75.7	68.9	63.5	56.0	48.0	8.9	6	5.3 Meter Dee
	Sandy Silty Clay	CL-ML	08 Mete	SPT-4	15	Nil	100	100.0	98.4	96.0	91.6	86.7	78.5	64.8	6.3	6.2	ound Surface
	Sandy Silty Clay	CL-ML		SPT-5	17	Nil	100	100	96.9	92.5	88.0	82.3	73.6	63.0	6.4	5.8	Water Lavel from Ground Surface 5.3 Meter Deep
	Silty Sand with Gravel	SM		SPT-6	23	Nil	100	100	91.3	81.0	68.4	59.0	48.0	36.7	8.6	N.P	Wate
	Silty Gravel with Sand	GM		SPT-7	24	Nil	100	100	86.8	66.2	48.7	37.5	27.8	19.5	10.4	N.P	
	Silty Gravel with Sand	GM		SPT-8	24	Nil	100	100	81.4	69.3	57.5	50.9	42.5	32.8	9.1	N.P	

Lab Manager (Q.C)

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

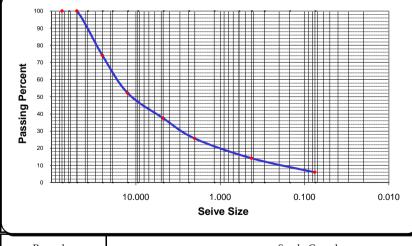
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil invistigation Materials	Testing Date :	18/01/2014
Location :	Bore Hole # 01 (Depth 01 Meter)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88/ASTM C-136/BS-1377 Part 2

Sieve Size			Mass		Cumulative		
			Retained	Mass	Retained	Passing	Limits
Standard	Alternative		g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in		3" D	owan Materials Gr	adation	
62.5 mm	2 1/2	in					
50.0 mm	2	in		Nil	0.0	100.0	
37.5 mm	1 1/2	in					
25.0 mm	1	in		980.5	25.8	74.2	
19.0 mm	3/4	in					
12.5 mm	1/2	in		1818.6	47.8	52.2	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			2376.9	62.5	37.5	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			2826.1	74.4	25.6	
1.18 mm	No. 16						
850µm	No. 20						
600 μm	No. 30						
425 μm	No. 40			3264.1	85.9	14.1	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			3575.8	94.1	5.9	
Pan							

TOTAL Weight 3801 Grams



Remarks:	
D_{60}	18.0
D_{30}	2.0
D 10	0.21
Си	85.7
Сс	1.058
Graval %	62.5
Sand %	31.5
Finer	5.9

Remarks: Sandy Gravel

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil invistigation Materials	Testing Date :	18/01/2014
Location :	Bore Hole # 01 (Depth 02 Meters)	Sampled By:	KA Rep,

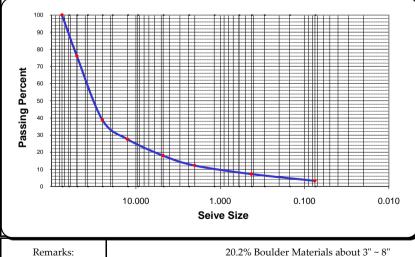
SIEVE ANALYSIS

AASHTO T-27, T-88 / ASTM C-136 / BS-1377 Part 2

Sieve Size			Mass		Cumulative		
			Retained	Mass	Retained	Passing	Limits
Standard	Alternative		g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in		3" D	owan Materials Gra	dation	
62.5 mm	2 1/2	in					
50.0 mm	2	in		734	23.9	76.1	
37.5 mm	1 1/2	in					
25.0 mm	1	in		1875.7	61.1	38.9	
19.0 mm	3/4	in					
12.5 mm	1/2	in		2225.7	72.5	27.5	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			2517.3	82.0	18.0	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			2693.3	87.8	12.2	
1.18 mm	No. 16						
850µm	No. 20						
600 μm	No. 30						
425 μm	No. 40			2847.2	92.8	7.2	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			2967.4	96.7	3.3	
Pan					_		

TOTAL Weight

3069 Grams



 D_{60} 38.0 D_{30} 16.4 1.3 D_{10} 29.2 Си

Remarks:

Finer

Cc5.445Graval % 82.0 Sand % 14.7

3.3

20.2% Boulder Materials about 3" ~ 8"

Tested By

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

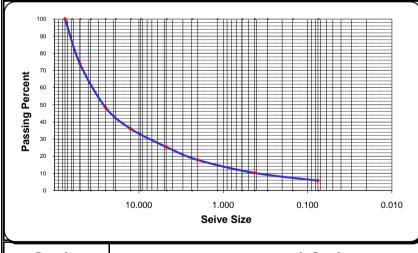
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil invistigation Materials	Testing Date :	18/01/2014
Location :	Bore Hole # 01 (Depth 03 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88/ASTM C-136/BS-1377 Part 2

Sieve Size			Mass		Cumulative		
			Retained	Mass	Retained	Passing	Limits
Standard Alternative			g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in		3" D	owan Materials Gra	dation	
62.5 mm	2 1/2	in					
50.0 mm	2	in		1046.1	25.9	74.1	
37.5 mm	1 1/2	in					
25.0 mm	1	in		2071.4	51.4	48.6	
19.0 mm	3/4	in					
12.5 mm	1/2	in		2580.3	64.0	36.0	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			3006.5	74.6	25.4	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			3313.5	82.2	17.8	
1.18 mm	No. 16						
850µm	No. 20						
600 μm	No. 30						
425 μm	No. 40			3619.1	89.8	10.2	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			3800.6	94.3	5.7	
Pan							

TOTAL Weight 4032 Grams



Remarks:	
D_{60}	38.5
D_{30}	7.9
$D_{\ 10}$	0.5
Си	77.0
Сс	3.242
Graval %	74.6
Sand %	19.7
Finer	5.7

Remarks: sandy Graval

Tested By

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

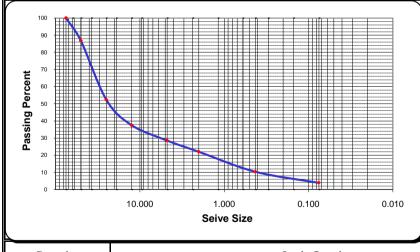
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil invistigation Materials	Testing Date :	18/01/2014
Location :	Bore Hole # 01 (Depth 04 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88/ASTM C-136/BS-1377 Part 2

	Sieve Size				Cumulative		Specification
			Retained	Mass	Retained	Passing	Limits
Standard	Alter	native	g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in		3" D	owan Materials Gra	dation	
62.5 mm	2 1/2	in					
50.0 mm	2	in		455	13.3	86.7	
37.5 mm	1 1/2	in					
25.0 mm	1	in		1631.5	47.7	52.3	
19.0 mm	3/4	in					
12.5 mm	1/2	in		2138	62.5	37.5	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			2446.7	71.5	28.5	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			2670.8	78.0	22.0	
1.18 mm	No. 16						
850µm	No. 20						
600 µm	No. 30						
425 μm	No. 40			3069.2	89.7	10.3	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			3289.3	96.1	3.9	
Pan							
			i	-			•

TOTAL Weight 3423 Grams



Remarks:	
D_{60}	30.0
D 30	6.2
D ₁₀	0.44
Си	68.2
Сс	2.912
Graval %	71.5
Sand %	24.6
Finer	3.9

Remarks: Sandy Graval

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

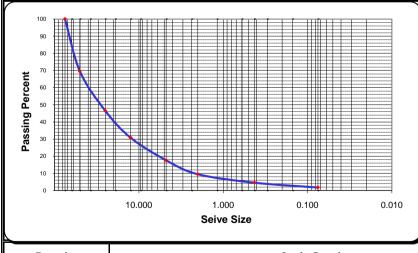
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil invistigation Materials	Testing Date :	18/01/2014
Location :	Bore Hole # 01 (Depth 05 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88/ASTM C-136/BS-1377 Part 2

Sieve Size			Mass		Cumulative	Specification	
Standard Alternative			Retained	Mass	Retained	Passing	Limits
			g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in		3" D	owan Materials Gra	adation	
62.5 mm	2 1/2	in					
50.0 mm	2	in		1466.3	30.4	69.6	
37.5 mm	1 1/2	in					
25.0 mm	1	in		2578.1	53.5	46.5	
19.0 mm	3/4	in					
12.5 mm	1/2	in		3338.4	69.2	30.8	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			3969.8	82.3	17.7	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			4361.4	90.5	9.5	
1.18 mm	No. 16						
850µm	No. 20						
600 μm	No. 30						
425 μm	No. 40			4600.7	95.4	4.6	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			4739.2	98.3	1.7	
Pan							

TOTAL Weight 4821 Grams



Remarks:	
D 60	39.8
D 30	12.5
D ₁₀	2.5
Си	15.9
Сс	1.570
Graval %	82.3
Sand %	16.0
Finer	1.7

Remarks: Sandy Gravel

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

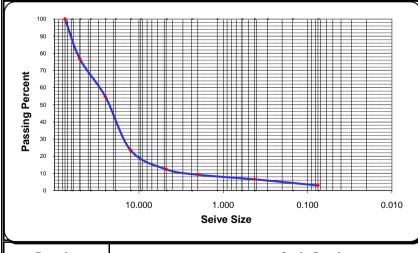
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil invistigation Materials	Testing Date :	18/01/2014
Location :	Bore Hole # 01 (Depth 06 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88/ASTM C-136/BS-1377 Part 2

Sieve Size		Mass		Cumulative			
			Retained	Mass	Retained	Passing	Limits
Standard	Alter	native	g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in		3" D	owan Materials Gra	dation	
62.5 mm	2 1/2	in		0	0.0	100.0	
50.0 mm	2	in		854.9	23.2	76.8	
37.5 mm	1 1/2	in					
25.0 mm	1	in		1660.9	45.2	54.8	
19.0 mm	3/4	in					
12.5 mm	1/2	in		2814.2	76.5	23.5	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			3222.5	87.6	12.4	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			3339.7	90.8	9.2	
1.18 mm	No. 16						
850µm	No. 20						
600 μm	No. 30						
425 μm	No. 40			3436.6	93.5	6.5	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			3567.6	97.0	3.0	
Pan							

TOTAL Weight 3677 Grams



Remarks:	
D 60	29.0
D 30	16.8
D ₁₀	3.7
Си	7.8
Сс	2.630
Graval %	87.6
Sand %	9.4
Finer	3.0

Remarks: Sandy Gravel

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

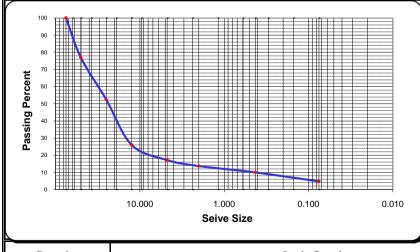
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil invistigation Materials	Testing Date :	18/01/2014
Location :	Bore Hole # 01 (Depth 07 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88 / ASTM C-136 / BS-1377 Part 2

	Sieve Size		Mass		Cumulative		Specification
			Retained	Mass	Retained	Passing	Limits
Standard	Altern	native	g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in					
62.5 mm	2 1/2	in		Nil	0.0	100.0	
50.0 mm	2	in		1131.8	23.1	76.9	
37.5 mm	1 1/2	in					
25.0 mm	1	in		2336.9	47.6	52.4	
19.0 mm	3/4	in					
12.5 mm	1/2	in		3633.5	74.0	26.0	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			4066.1	82.8	17.2	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			4236.9	86.3	13.7	
1.18 mm	No. 16						
850µm	No. 20						
600 µm	No. 30						
425 μm	No. 40			4419.9	90.0	10.0	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			4676.6	95.3	4.7	
Pan							

TOTAL Weight 4909 Grams



Remarks:	
D_{60}	32.0
D_{30}	15.5
D 10	0.12
Си	266.7
Сс	62.565
Graval %	82.8
Sand %	12.4
Finer	4.7

Remarks: Sandy Gravel

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil invistigation Materials	Testing Date :	18/01/2014
Location :	Bore Hole # 01 (Depth 08 Meters)	Sampled By:	KA Rep,

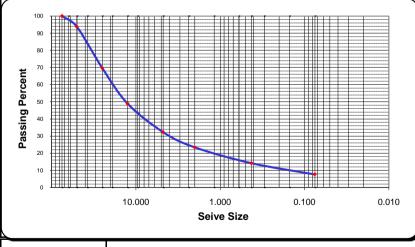
SIEVE ANALYSIS

AASHTO T-27, T-88/ASTM C-136/BS-1377 Part 2

		Sieve Size Mass		Cumulative		
		Retained	Mass	Retained	Passing	Limits
Alternative		g	Retained (g)	%	%	%
4	in					
3	in		3" D	owan Materials Gra	dation	
2 1/2	in					
2	in		207.4	6.3	93.7	
1 1/2	in					
1	in		1005.6	30.4	69.6	
3/4	in					
1/2	in		1692.1	51.1	48.9	
3/8	in					
1/4	in					
No. 4			2243.6	67.7	32.3	
No. 6						
No. 8						
No. 10			2536.1	76.5	23.5	
No. 16						
No. 20						
No. 30						
No. 40			2844.6	85.9	14.1	
No. 50						
No. 80						
No. 100						
No. 200			3062	92.4	7.6	
	4 3 2 1/2 2 1 1/2 1 3/4 1/2 3/8 1/4 No. 4 No. 6 No. 8 No. 10 No. 16 No. 20 No. 30 No. 40 No. 50 No. 80 No. 100	4 in 3 in 2 1/2 in 2 in 1 1/2 in 1 in 3/4 in 1/2 in 3/8 in 1/4 in No. 4 No. 6 No. 8 No. 10 No. 16 No. 20 No. 30 No. 40 No. 50 No. 80 No. 100	4 in 3 in 2 1/2 in 2 in 1 1/2 in 1 in 3/4 in 1/2 in 3/8 in 1/4 in No. 4 No. 6 No. 8 No. 10 No. 16 No. 20 No. 30 No. 40 No. 50 No. 80 No. 100	4 in 3 in 3"D 2 1/2 in 207.4 1 1/2 in 1005.6 3/4 in 1692.1 3/8 in 1692.1 No. 4 2243.6 No. 6 No. 8 No. 10 2536.1 No. 16 No. 20 No. 30 No. 40 No. 50 No. 80 No. 100	4 in 3 in 2 1/2 in 2 in 11/2 in 1 in 1005.6 30.4 3/4 in 1/2 in 3/8 in 1/4 in No. 4 2243.6 67.7 No. 6 67.7 No. 8 2536.1 No. 10 2536.1 76.5 No. 30 2844.6 No. 50 85.9 No. 80 No. 100	4 in 3" Dowan Materials Gradation 2 1/2 in 207.4 6.3 93.7 1 1/2 in 207.4 6.3 93.7 1 1/2 in 1005.6 30.4 69.6 3/4 in 1692.1 51.1 48.9 3/8 in 1692.1 51.1 48.9 3/8 in 2243.6 67.7 32.3 No. 4 2243.6 67.7 32.3 No. 6 2536.1 76.5 23.5 No. 10 2536.1 76.5 23.5 No. 16 2844.6 85.9 14.1 No. 50 2844.6 85.9 14.1 No. 80 No. 100 100 100 100

TOTAL Weight

3313 Grams



D 60 19.0

Remarks:

 D_{30} 4.1 D_{10} 0.17

 Cu
 111.8

 Cc
 5.154

Graval % 67.7

 Sand %
 24.7

 Finer
 7.6

Remarks: 25 % Boulder Materials about 3" ~ 8"

Tested By

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

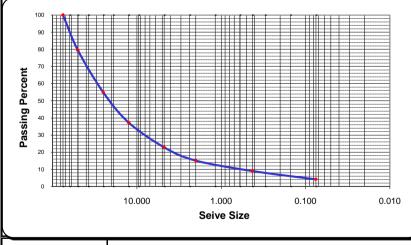
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil Invistigation Materials	Testing Date :	18/01/2014
Location :	Bore Hole # 02 (Depth 08 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88/ASTM C-136/BS-1377 Part 2

Sieve Size		Mass	Cumulative			Specification	
			Retained	Mass	Retained	Passing	Limits
Standard	Alternative		g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in		3" D	owan Materials Gra	dation	
62.5 mm	2 1/2	in					
50.0 mm	2	in		892.3	20.6	79.4	
37.5 mm	1 1/2	in					
25.0 mm	1	in		1953.6	45.1	54.9	
19.0 mm	3/4	in					
12.5 mm	1/2	in		2715.1	62.6	37.4	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			3345.1	77.2	22.8	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			3679.5	84.9	15.1	
1.18 mm	No. 16						
850µm	No. 20						
600 μm	No. 30						
425 μm	No. 40			3944.8	91.0	9.0	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			4152.4	95.8	4.2	1
Pan							
							<u>I</u>

TOTAL Weight 4334 Grams



Remarks:	
D 60	29.0
D 30	8.2
D 10	0.68
Си	42.6
Сс	3.410
Graval %	77.2
Sand %	18.6
Finer	4.2

Remarks: Sandy Graval

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil invistigation Materials	Testing Date :	18/01/2014
Location :	Bore Hole # 02 (Depth 01 Meter)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88/ASTM C-136/BS-1377 Part 2

Standard Al	tarnativa	Retained			Cumulative		
Standard Al	tornativo		Mass	Retained	Passing	Limits	
	Alternative		Retained (g)	%	%	%	
100 mm 4	in	g					
75.0 mm 3	in		3" D	owan Materials Gra	dation		
62.5 mm 2 1/2	in						
50.0 mm 2	in		999.6	17.6	82.4		
37.5 mm 1 1/2	in						
25.0 mm 1	in		2253.1	39.6	60.4		
19.0 mm 3/4	in						
12.5 mm 1/2	in		3065.4	53.9	46.1		
9.5 mm 3/8	in						
6.3 mm 1/4	in						
4.75 mm No. 4			3792	66.6	33.4		
3.35 mm No. 6							
2.36 mm No. 8							
2.00 mm No. 10			4402.9	77.4	22.6		
1.18 mm No. 16							
850μm No. 20							
600 μm No. 30							
425 μm No. 40			4931	86.6	13.4		
300 μm No. 50							
180 μm No. 80							
150 μm No. 100							
75 μm No. 200			5366.9	94.3	5.7		
Pan							

TOTAL Weight 5691 Grams



Remarks: D_{60} 35.8 D_{30} 3.9 0.24 D_{10} Си 149.2 Cc1.770 Graval % 66.6 Sand % 27.7 5.7 Finer

Remarks: Sandy Gravel

Tested By

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

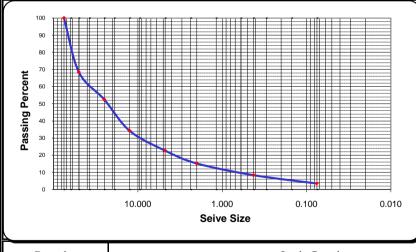
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil invistigation Materials	Testing Date :	18/01/2014
Location :	Bore Hole # 02 (Depth 02 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88/ASTM C-136/BS-1377 Part 2

Sieve Size			Mass		Cumulative		Specification
			Retained	Mass	Retained	Passing	Limits
Standard	Alternative		g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in		3" D	owan Materials Gra	dation	
62.5 mm	2 1/2	in					
50.0 mm	2	in		1636.9	31.5	68.5	
37.5 mm	1 1/2	in					
25.0 mm	1	in		2468.4	47.6	52.4	
19.0 mm	3/4	in					
12.5 mm	1/2	in		3414.6	65.8	34.2	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			4013.4	77.3	22.7	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			4403.1	84.8	15.2	
1.18 mm	No. 16						
850µm	No. 20						
600 μm	No. 30						
425 μm	No. 40			4756.6	91.6	8.4	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			5005.9	96.5	3.5	
Pan							
			1	-			•

TOTAL Weight 5190 Grams



Remarks:	
D_{60}	38.7
D 30	9.8
D ₁₀	0.8
Си	48.4
Сс	3.102
Graval %	77.3
Sand %	19.1
Finer	3.5

Remarks: Sandy Gravel

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

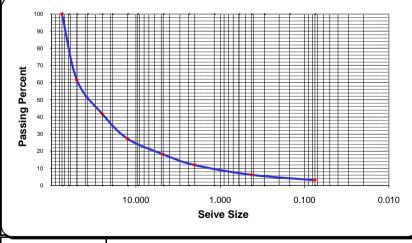
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Name: Construction of Bridge # 09 at Gardez to Khost Road		16/01/2014
Description :	Soil Invistigation Materials	Testing Date :	18/01/2014
Location :	Bore Hole # 02 (Depth 03 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88/ASTM C-136/BS-1377 Part 2

Sieve Size			Mass		Cumulative	Specification	
			Retained	Mass	Retained	Passing	Limits
Standard	ndard Alternative		g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in		3" D	owan Materials Gra	dation	
62.5 mm	2 1/2	in					
50.0 mm	2	in		1504.1	38.5	61.5	
37.5 mm	1 1/2	in					
25.0 mm	1	in		2274.9	58.2	41.8	
19.0 mm	3/4	in					
12.5 mm	1/2	in		2841.7	72.8	27.2	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			3195.8	81.8	18.2	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			3441.3	88.1	11.9	
1.18 mm	No. 16						
850µm	No. 20						
600 µm	No. 30						
425 μm	No. 40			3661.9	93.8	6.2	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			3782.1	96.8	3.2	
Pan							

TOTAL Weight 3906 Grams



Remarks:	
D 60	50.0
D 30	16.4
D 10	1.65
Си	30.3
Сс	3.260
Graval %	81.8
Sand %	15.0
Finer	3.2

Remarks: Sandy Graval

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil Invistigation Materials	Testing Date :	18/01/2014
Location :	Bore Hole # 02 (Depth 04 Meters)	Sampled By:	KA Rep,

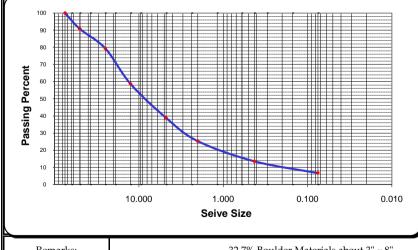
SIEVE ANALYSIS

AASHTO T-27, T-88 / ASTM C-136 / BS-1377 Part 2

			Mass		Cumulative		Specification
	Standard Alternative		Retained	Mass	Retained	Passing	Limits
Standard			g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in		3" De	owan Materials Gra	dation	
62.5 mm	2 1/2	in					
50.0 mm	2	in		354.2	9.3	90.7	
37.5 mm	1 1/2	in					
25.0 mm	1	in		788.3	20.7	79.3	
19.0 mm	3/4	in					
12.5 mm	1/2	in		1578.4	41.4	58.6	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			2332.6	61.1	38.9	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			2849.8	74.7	25.3	
1.18 mm	No. 16						
850µm	No. 20						
600 μm	No. 30						
425 μm	No. 40			3300.8	86.5	13.5	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			3560.2	93.3	6.7	
Pan							

TOTAL Weight

3815 Grams



 D_{60} 22.0 D_{30} 3.0

Remarks:

0.22 D_{10} Си 100.0

Cc1.860 Graval % 61.1

Sand % 32.2 6.7 Finer

Remarks: 32.7% Boulder Materials about 3" ~ 8"

Tested By

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil Invistigation Materials	Testing Date :	18/01/2014
Location :	Bore Hole # 02 (Depth 05 Meters)	Sampled By:	KA Rep,

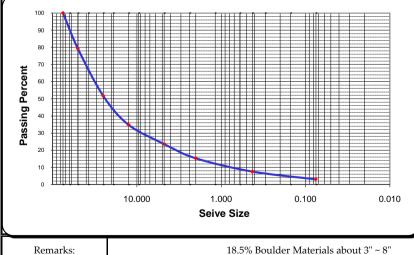
SIEVE ANALYSIS

AASHTO T-27, T-88/ASTM C-136/BS-1377 Part 2

Standard 100 mm	Alteri 4	native	Retained	Mass	Retained	D	-
		native			Ketaineu	Passing	Limits
100 mm	4	lard Alternative		Retained (g)	%	%	%
		in	g				
75.0 mm	3	in		3" De	owan Materials Gra	dation	
62.5 mm	2 1/2	in					
50.0 mm	2	in		743.7	20.8	79.2	
37.5 mm	1 1/2	in					
25.0 mm	1	in		1735	48.4	51.6	
19.0 mm	3/4	in					
12.5 mm	1/2	in		2335.5	65.2	34.8	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			2737.3	76.4	23.6	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			3037.2	84.8	15.2	
1.18 mm	No. 16						
850µm	No. 20						
600 μm	No. 30						
425 μm	No. 40			3314.1	92.5	7.5	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			3472.8	96.9	3.1	
Pan							

TOTAL Weight

3583.2 Grams



 D_{60} 31.5 D_{30} 9.0 0.9 D_{10} Си 35.0 Cc2.857 Graval % 76.4

20.5

3.1

Remarks:

Sand %

Finer

Remarks:

Tested By

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil Invistigation Materials	Testing Date :	18/01/2014
Location :	Bore Hole # 02 (Depth 06 Meters)	Sampled By:	KA Rep,

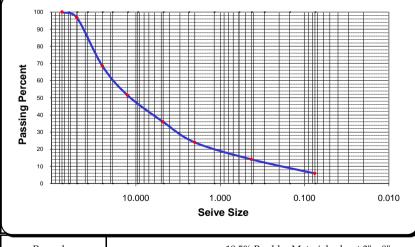
SIEVE ANALYSIS

AASHTO T-27, T-88/ASTM C-136/BS-1377 Part 2

Sieve Size		Mass		Cumulative		Specification	
			Retained	Mass	Mass Retained Passing		
Standard	Alternative		g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in		3" D	owan Materials Gr	adation	
62.5 mm	2 1/2	in					
50.0 mm	2	in		137.2	3.2	96.8	
37.5 mm	1 1/2	in					
25.0 mm	1	in		1339.6	31.4	68.6	
19.0 mm	3/4	in					
12.5 mm	1/2	in		2072.2	48.6	51.4	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			2731.2	64.1	35.9	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			3239.9	76.0	24.0	
1.18 mm	No. 16						
850µm	No. 20						
600 μm	No. 30						
425 μm	No. 40			3663.2	85.9	14.1	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			4013.1	94.1	5.9	
Pan							

TOTAL Weight

4263 Grams



D₆₀ 19.0

Remarks:

 D_{30} 3.3 D_{10} 0.2 Cu 95.0

 Cc
 2.866

 Graval %
 64.1

 Sand %
 30.1

 Finer
 5.9

Remarks:

19.5% Boulder Materials about 3" ~ 8"

Tested By

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil Invistigation Materials	Testing Date :	18/01/2014
Location :	Bore Hole # 02 (Depth 07 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88/ASTM C-136/BS-1377 Part 2

Sieve Size		Mass		Cumulative		Specification	
			Retained	Mass	Mass Retained Passing		
Standard	Alternative		g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in		3" D	owan Materials Gr	adation	
62.5 mm	2 1/2	in					
50.0 mm	2	in		284.4	6.8	93.2	
37.5 mm	1 1/2	in					
25.0 mm	1	in		1256.1	29.8	70.2	
19.0 mm	3/4	in					
12.5 mm	1/2	in		2187.3	52.0	48.0	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			2743.9	65.2	34.8	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			3054.9	72.6	27.4	
1.18 mm	No. 16						
850µm	No. 20						
600 μm	No. 30						
425 μm	No. 40			3423.5	81.3	18.7	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			3846.7	91.4	8.6	
Pan							

4209 Grams

TOTAL Weight



Remarks:	
D_{60}	19.6
D_{30}	2.9
D 10	0.10
Си	196.0
Сс	4.291
Graval %	65.2
Sand %	26.2
Finer	8.6

Remarks: 21.4% Boulder Materials about 3" \sim 8"

Tested By

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

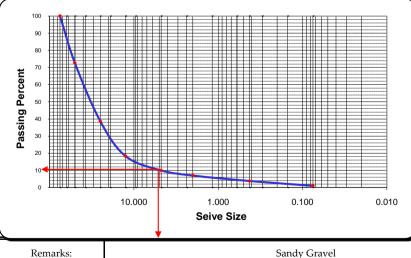
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil invistigation Materials	Testing Date :	19/01/2014
Location :	Bore Hole # 03 (Depth 01 Meter)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88/ASTM C-136/BS-1377 Part 2

Sieve Size		Mass		Cumulative		Specification	
			Retained	Mass	Retained	Passing	Limits
Standard	Standard Alternative		g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in		3" D	owan Materials Gra	dation	
62.5 mm	2 1/2	in					
50.0 mm	2	in		1529.1	27.3	72.7	
37.5 mm	1 1/2	in					
25.0 mm	1	in		3431.1	61.3	38.7	
19.0 mm	3/4	in					
12.5 mm	1/2	in		4574	81.8	18.2	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			5034.8	90.0	10.0	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			5205.9	93.1	6.9	
1.18 mm	No. 16						
850µm	No. 20						
600 μm	No. 30						
425 μm	No. 40			5381.8	96.2	3.8	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			5539.4	99.0	1.0	
Pan							

5594 Grams TOTAL Weight



Remarks: D_{60} 40.0 D_{30} 20.0 5.00 D_{10} Си 8.0 Cc2.000 Graval % 90.0 Sand % 9.0 Finer 1.0

Sandy Gravel

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

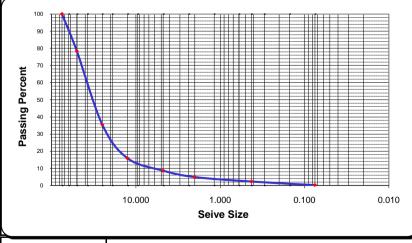
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil invistigation Materials	Testing Date :	19/01/2014
Location :	Bore Hole # 03 (Depth 02 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88 / ASTM C-136 / BS-1377 Part 2

ing Limits %
1
1
1
1
5
8
j
)
3
3
3

TOTAL Weight 4728 Grams



Remarks:	
D 60	29.0
D_{30}	22.0
D ₁₀	7.0
Си	4.1
Сс	2.384
Graval %	91.4
Sand %	8.4
Finer	0.3

Remarks: Sandy Gravel

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

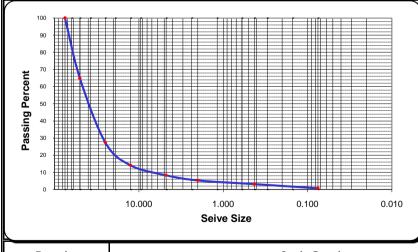
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil Invistigation Materials	Testing Date :	19/01/2014
Location :	Bore Hole # 03 (Depth 03 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88/ASTM C-136/BS-1377 Part 2

Sieve Size Standard Alternative		Mass		Cumulative		Specification	
		Retained	Mass	Retained	Passing	Limits	
		native	g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in		3" D	owan Materials Gra	dation	
62.5 mm	2 1/2	in					
50.0 mm	2	in		2256.3	35.2	64.8	
37.5 mm	1 1/2	in					
25.0 mm	1	in		4659	72.6	27.4	
19.0 mm	3/4	in					
12.5 mm	1/2	in		5512.8	85.9	14.1	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			5884.5	91.7	8.3	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			6079.4	94.7	5.3	
1.18 mm	No. 16						
850µm	No. 20						
600 μm	No. 30						
425 μm	No. 40			6219.6	96.9	3.1	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			6370.1	99.3	0.7	
Pan							

TOTAL Weight 6418 Grams



Remarks:	
D_{60}	49.0
D 30	26.0
D 10	8.00
Си	6.1
Сс	1.724
Graval %	91.7
Sand %	7.6
Finer	0.7

Remarks: Sandy Graval

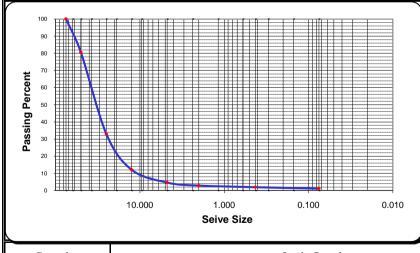
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil Invistigation Materials	Testing Date :	19/01/2014
Location :	Bore Hole # 03 (Depth 04 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88/ASTM C-136/BS-1377 Part 2

Sieve Size		Mass		Cumulative		Specification	
			Retained	Mass	Retained	Passing	Limits
Standard	Alterr	ative	g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in		3" D	owan Materials Gra	dation	
62.5 mm	2 1/2	in					
50.0 mm	2	in		1094	19.4	80.6	
37.5 mm	1 1/2	in					
25.0 mm	1	in		3767.2	66.9	33.1	
19.0 mm	3/4	in					
12.5 mm	1/2	in		4949.2	87.9	12.1	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			5369	95.4	4.6	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			5466.7	97.1	2.9	
1.18 mm	No. 16						
850µm	No. 20						
600 µm	No. 30						
425 μm	No. 40			5520.3	98.1	1.9	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			5569	98.9	1.1	
Pan							
			_				

TOTAL Weight 5629 Grams



Remarks:	
D_{60}	39.0
D_{30}	24.0
D 10	11.50
Си	3.4
Сс	1.284
Graval %	95.4
Sand %	3.6
Finer	1.1

Remarks: Sandy Graval

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil Invistigation Materials	Testing Date :	19/01/2014
Location :	Bore Hole # 03 (Depth 05 Meters)	Sampled By:	KA Rep,

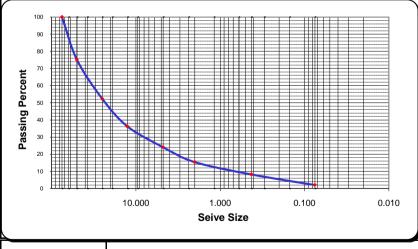
SIEVE ANALYSIS

AASHTO T-27, T-88/ASTM C-136/BS-1377 Part 2

Sieve Size		Mass	Mass Cumulative			Specification	
			Retained	Mass	Retained	Passing	Limits
Standard	Alter	native	g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in		3" D	owan Materials Gra	dation	
62.5 mm	2 1/2	in					
50.0 mm	2	in		1158.2	24.9	75.1	
37.5 mm	1 1/2	in					
25.0 mm	1	in		2223.8	47.7	52.3	
19.0 mm	3/4	in					
12.5 mm	1/2	in		2977.9	63.9	36.1	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			3538.3	75.9	24.1	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			3941.9	84.6	15.4	
1.18 mm	No. 16						
850µm	No. 20						
600 μm	No. 30						
425 μm	No. 40			4280	91.9	8.1	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			4565.3	98.0	2.0	
Pan							

TOTAL Weight

4659.6 Grams



 D 60
 32.0

 D 30
 8.0

 D 10
 0.76

 Cu
 42.1

 Cc
 2.632

 Graval %
 75.9

 Sand %
 22.0

Remarks:

Finer

Remarks:

23.9% Boulder Materials about 3" ~ 8"

Tested By

Lab Manager (QC)

2.0

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

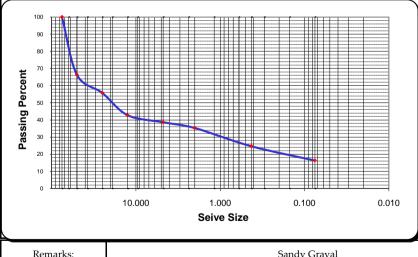
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil Invistigation Materials	Testing Date :	19/01/2014
Location :	Bore Hole # 03 (Depth 06 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88/ASTM C-136/BS-1377 Part 2

Standard Alternative g Retained (g) % Passing Limits 100 mm 4 in 100 mm 4 in 3 in 3"Down Materials Grade of the part of	Sieve Size		Mass		Cumulative	Specification		
100 mm				Retained	Mass	Retained	Passing	Limits
100 mm	Standard	Standard Alternative		g	Retained (g)	%	%	%
62.5 mm 2 1/2 in 1265 33.6 66.4 37.5 mm 1 1/2 in 1665.7 44.3 55.7 19.0 mm 3/4 in 1665.7 44.3 55.7 19.0 mm 3/4 in 17.2 in 2152.8 57.2 42.8 9.5 mm 3/8 in 214 in 24.5 in 25.3 in 38.7 6.3 mm 1/4 in 22307.1 61.3 38.7 3.35 mm No. 6 236 mm No. 8 22.00 mm No. 10 2435.7 64.7 35.3 1.18 mm No. 16 850 μm No. 30 2836.9 75.4 24.6 300 μm No. 30 2836.9 75.4 24.6 310 μm No. 80 150 μm No. 100 150 μm No. 100 150 μm No. 100 150 μm No. 200 150 μm No. 200 150 μm No. 80 150 μm No. 80 150 μm No. 100 150 μm No. 200 150 μm No.	100 mm	4	in					
50.0 mm 2	75.0 mm	3	in		3" D	owan Materials Gra	dation	
37.5 mm 1 1/2 in 1 665.7 44.3 55.7 19.0 mm 3/4 in 1 665.7 44.3 55.7 19.0 mm 3/4 in 2152.8 57.2 42.8 9.5 mm 1/2 in 2152.8 57.2 42.8 9.5 mm 3/8 in 3/8	62.5 mm	2 1/2	in					
25.0 mm 1 in 1665.7 44.3 55.7 19.0 mm 3/4 in 2152.8 57.2 42.8 9.5 mm 1/2 in 2152.8 57.2 42.8 9.5 mm 3/8 in 3/8 in 6.3 mm 1/4 in 2307.1 61.3 38.7 3.35 mm No. 4 2307.1 61.3 38.7 2.36 mm No. 8 30.8 38.7 35.3 1.18 mm No. 10 2435.7 64.7 35.3 1.18 mm No. 16 30.0 30.0 30.0 30.0 425 μm No. 40 2836.9 75.4 24.6 24.6 300 μm No. 50 30.0 3148.5 83.7 16.3 30.0 75 μm No. 200 3148.5 83.7 16.3 30.0 3148.5 33.7 16.3 30.0	50.0 mm	2	in		1265	33.6	66.4	
19.0 mm 3/4 in 2152.8 57.2 42.8 9.5 mm 3/8 in 3/8 in 6.3 mm 1/4 in 2307.1 61.3 38.7 4.75 mm No. 4 2307.1 61.3 38.7 3.35 mm No. 6 38.7 35.3 2.36 mm No. 8 35.3 35.3 1.18 mm No. 10 2435.7 64.7 35.3 1.18 mm No. 16 35.0 35.3 850 μm No. 20 30.0 30.0 35.3 425 μm No. 40 2836.9 75.4 24.6 300 μm No. 50 30.0 3148.5 83.7 16.3	37.5 mm	1 1/2	in					
12.5 mm 1/2 in 2152.8 57.2 42.8 9.5 mm 3/8 in 6.3 mm 1/4 in 2307.1 61.3 38.7 38.7 3.35 mm No. 4 2307.1 61.3 38.7 38.7 3.35 mm No. 6 2.36 mm No. 8 2435.7 64.7 35.3 35.3 35.3 35.3 35.3 35.3 35.3 35	25.0 mm	1	in		1665.7	44.3	55.7	
9.5 mm 3/8 in 2307.1 61.3 38.7 4.75 mm No. 4 2307.1 61.3 38.7 3.35 mm No. 6 236 mm No. 8 2.00 mm No. 10 2435.7 64.7 35.3 1.18 mm No. 16 35.3 35.3 850μm No. 20 300 μm 30.2 30.2 425 μm No. 40 2836.9 75.4 24.6 300 μm No. 50 30.2 30.2 30.2 180 μm No. 80 30.2 3148.5 83.7 16.3	19.0 mm	3/4	in					
6.3 mm 1/4 in 2307.1 61.3 38.7 3.35 mm No. 6 2307.1 61.3 38.7 2.36 mm No. 8 2300 mm No. 10 2435.7 64.7 35.3 1.18 mm No. 16 2435.7 64.7 35.3 35.3 1.18 mm No. 16 2435.7 64.7 35.3 35.3 850μm No. 20 25.0	12.5 mm	1/2	in		2152.8	57.2	42.8	
4.75 mm No. 4 2307.1 61.3 38.7 3.35 mm No. 6 2.36 mm No. 8 2.00 mm No. 10 2435.7 64.7 35.3 1.18 mm No. 16 850μm No. 20 600 μm No. 30 425 μm No. 40 2836.9 75.4 24.6 300 μm No. 50 180 μm No. 80 150 μm No. 100	9.5 mm	3/8	in					
3.35 mm No. 6 2.36 mm No. 8 2.00 mm No. 10 2.435.7 64.7 35.3 1.18 mm No. 16 850μm No. 20 600 μm No. 30 425 μm No. 40 2836.9 75.4 24.6 300 μm No. 50 180 μm No. 80 150 μm No. 100 75 μm No. 200 3.3148.5 83.7 16.3	6.3 mm	1/4	in					
2.36 mm No. 8 2.00 mm No. 10 2435.7 64.7 35.3 1.18 mm No. 16 ————————————————————————————————————	4.75 mm	No. 4			2307.1	61.3	38.7	
2.00 mm No. 10 2435.7 64.7 35.3 1.18 mm No. 16 850μm No. 20 600 μm No. 30 425 μm No. 40 2836.9 75.4 24.6 300 μm No. 50 180 μm No. 80 150 μm No. 100 75 μm No. 200 3148.5 83.7 16.3	3.35 mm	No. 6						
1.18 mm No. 16	2.36 mm	No. 8						
850μm No. 20	2.00 mm	No. 10			2435.7	64.7	35.3	
600 μm No. 30 2836.9 75.4 24.6 300 μm No. 50 2836.9 75.4 24.6 24.6 24.6 250 μm No. 80 250 μm No. 100 250 3148.5 83.7 16.3	1.18 mm	No. 16						
425 μm No. 40 2836.9 75.4 24.6 300 μm No. 50 180 μm No. 80 150 μm No. 100 75 μm No. 200 3148.5 83.7 16.3	850µm	No. 20						
300 μm No. 50 180 μm No. 80 150 μm No. 100 75 μm No. 200 3148.5 83.7 16.3	600 μm	No. 30						
180 μm No. 80 150 μm No. 100 75 μm No. 200 3148.5 83.7 16.3	425 μm	No. 40			2836.9	75.4	24.6	
150 μm No. 100 3148.5 83.7 16.3	300 μm	No. 50						
75 μm No. 200 3148.5 83.7 16.3	180 μm	No. 80						
·	150 μm	No. 100						
Pan Pan	75 μm	No. 200			3148.5	83.7	16.3	
	Pan							

3762 Grams TOTAL Weight



Remarks:

 D_{60}

 D_{30}

 D_{10}

Си

Cc

Graval % 61.3 Sand % 22.4

Finer 16.3

Remarks: Sandy Graval

Tested By

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil Invistigation Materials	Testing Date :	19/01/2014
Location :	Bore Hole # 03 (Depth 07 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88/ASTM C-136/BS-1377 Part 2

Sieve Size		Mass		Cumulative		Specification	
			Retained	Mass	Retained	Passing	Limits
Standard	Alter	native	g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in		3" D	owan Materials Gra	adation	
62.5 mm	2 1/2	in					
50.0 mm	2	in		1386.1	34.0	66.0	
37.5 mm	1 1/2	in					
25.0 mm	1	in		2112.7	51.8	48.2	
19.0 mm	3/4	in					
12.5 mm	1/2	in		3019.3	74.0	26.0	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			3372.5	82.6	17.4	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			3624.7	88.8	11.2	
1.18 mm	No. 16						
850µm	No. 20						
600 µm	No. 30						
425 μm	No. 40			3845.9	94.2	5.8	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			4032.2	98.8	1.2	
Pan							

TOTAL Weight 4081 Grams



Remarks:	
D_{60}	41.0
D 30	16.0
D ₁₀	1.90
Си	21.6
Сс	3.286
Graval %	82.6
Sand %	16.2
Finer	1.2

Remarks: Sandy Graval

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

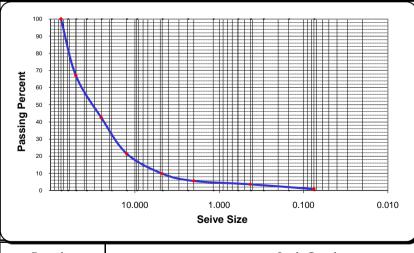
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil Invistigation Materials	Testing Date :	19/01/2014
Location :	Bore Hole # 03 (Depth 08 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88/ASTM C-136/BS-1377 Part 2

Standard Alternative g Retained (g) % % 100 mm 4 in 3" Dowan Materials Gradation 75.0 mm 3 in 3" Dowan Materials Gradation 62.5 mm 2 1/2 in 1672.2 32.9 67.1 37.5 mm 1 1/2 in 2920.5 57.5 42.5 19.0 mm 3/4 in 3982.5 78.4 21.6 9.5 mm 3/8 in 3982.5 78.4 21.6 9.5 mm 3/8 in 4.75 mm 90.1 9.9 3.35 mm No. 4 4574.9 90.1 9.9 3.35 mm No. 6 2.36 mm No. 8 2.00 mm No. 10 4793.5 94.4 5.6 1.18 mm No. 16 4793.5 94.4 5.6 5.6	fication
100 mm 4 in 3" Dowan Materials Gradation 62.5 mm 2 1/2 in 1672.2 32.9 67.1 50.0 mm 2 in 1672.2 32.9 67.1 37.5 mm 1 1/2 in 2920.5 57.5 42.5 19.0 mm 3/4 in 3982.5 78.4 21.6 9.5 mm 3/8 in 3982.5 78.4 21.6 9.5 mm 3/8 in 4574.9 90.1 9.9 3.35 mm No. 4 4574.9 90.1 9.9 3.35 mm No. 6 4793.5 94.4 5.6 1.18 mm No. 16 4793.5 94.4 5.6	mits
100 mm 4 in 3" Dowan Materials Gradation 62.5 mm 2 1/2 in 1672.2 32.9 67.1 50.0 mm 2 in 1672.2 32.9 67.1 37.5 mm 1 1/2 in 2920.5 57.5 42.5 19.0 mm 3/4 in 2920.5 57.5 42.5 19.0 mm 3/4 in 3982.5 78.4 21.6 9.5 mm 3/8 in 3982.5 78.4 21.6 9.5 mm 3/8 in 4574.9 90.1 9.9 3.35 mm No. 4 4574.9 90.1 9.9 3.35 mm No. 6 4793.5 94.4 5.6 1.18 mm No. 16 4793.5 94.4 5.6	%
62.5 mm 2 1/2 in 1672.2 32.9 67.1 37.5 mm 1 1/2 in 2920.5 57.5 42.5 19.0 mm 3/4 in 3982.5 78.4 21.6 9.5 mm 3/8 in 2920.5 57.5 42.5 9.5 mm 1/2 in 3982.5 78.4 21.6 9.5 mm 3/8 in 3982.5 78.4 21.6 9.5 mm 1/4 in 4574.9 90.1 9.9 3.35 mm No. 4 4574.9 90.1 9.9 3.35 mm No. 6 90.1 9.9 3.35 mm No. 8 94.4 5.6 1.18 mm No. 16 4793.5 94.4 5.6	
50.0 mm 2 in 1672.2 32.9 67.1 37.5 mm 1 1/2 in 2920.5 57.5 42.5 19.0 mm 3/4 in 3982.5 78.4 21.6 9.5 mm 3/8 in 3982.5 78.4 21.6 9.5 mm 3/8 in 9.1 9.9 4.75 mm No. 4 4574.9 90.1 9.9 3.35 mm No. 6 9.3 94.4 5.6 2.00 mm No. 10 4793.5 94.4 5.6 1.18 mm No. 16 7.6 7.6 7.6	
37.5 mm 1 1/2 in 2920.5 57.5 42.5 19.0 mm 3/4 in 3982.5 78.4 21.6 9.5 mm 3/8 in 2920.5 78.4 21.6 9.5 mm 3/8 in 3982.5 78.4 21.6 9.5 mm 3/8 in 9.9 90.1 9.9 4.75 mm No. 4 4574.9 90.1 9.9 3.35 mm No. 6 90.1 9.9 3.35 mm No. 6 94.4 5.6 2.36 mm No. 10 4793.5 94.4 5.6 1.18 mm No. 16 793.5 94.4 5.6	
25.0 mm 1 in 2920.5 57.5 42.5 19.0 mm 3/4 in 3982.5 78.4 21.6 9.5 mm 3/8 in 21.6 21.6 9.5 mm 3/8 in 3982.5 78.4 21.6 9.5 mm 3/8 in 3982.5 78.4 21.6 4.75 mm No. 4 4574.9 90.1 9.9 3.35 mm No. 6 9.9 90.1 9.9 3.35 mm No. 6 9.9 90.1 9.9 3.00 mm No. 8 94.4 5.6 1.18 mm No. 16 4793.5 94.4 5.6	
19.0 mm 3/4 in 3982.5 78.4 21.6 9.5 mm 3/8 in 6.3 mm 1/4 in 4.75 mm No. 4 4574.9 90.1 9.9 3.35 mm No. 6 2.36 mm No. 8 2.00 mm No. 10 4793.5 94.4 5.6 1.18 mm No. 16	
12.5 mm 1/2 in 3982.5 78.4 21.6 9.5 mm 3/8 in 6.3 mm 1/4 in 4.75 mm No. 4 4574.9 90.1 9.9 3.35 mm No. 6 2.36 mm No. 8 2.00 mm No. 10 4793.5 94.4 5.6 1.18 mm No. 16	
9.5 mm 3/8 in 6.3 mm 1/4 in 4.75 mm No. 4 4574.9 90.1 9.9 3.35 mm No. 6 2.36 mm No. 8 2.00 mm No. 10 4793.5 94.4 5.6 1.18 mm No. 16	
6.3 mm 1/4 in 4.75 mm No. 4 4574.9 90.1 9.9 3.35 mm No. 6 2.36 mm No. 8 2.00 mm No. 10 4793.5 94.4 5.6 1.18 mm No. 16	
4.75 mm No. 4 4574.9 90.1 9.9 3.35 mm No. 6 2.36 mm No. 8 2.00 mm No. 10 4793.5 94.4 5.6 1.18 mm No. 16	
3.35 mm No. 6 2.36 mm No. 8 2.00 mm No. 10 4793.5 94.4 5.6 1.18 mm No. 16	
2.36 mm No. 8 2.00 mm No. 10 4793.5 94.4 5.6 1.18 mm No. 16 4793.5 94.4 5.6	
2.00 mm No. 10 4793.5 94.4 5.6 1.18 mm No. 16	
1.18 mm No. 16	
850μm No. 20	
600 μm No. 30	
425 μm No. 40 4894.1 96.4 3.6	
300 μm No. 50	
180 μm No. 80	
150 μm No. 100	
75 μm No. 200 5038.3 99.2 0.8	
Pan	

TOTAL Weight 5078 Grams



Remarks: D_{60} 42.0 D_{30} 18.0 5.00 D_{10} Си 8.4 Cc1.543 Graval % 90.1 Sand % 9.1 0.8 Finer

Remarks: Sandy Graval

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

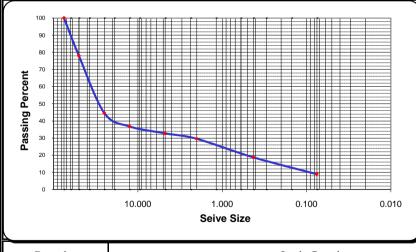
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil invistigation Materials	Testing Date :	19/01/2014
Location :	Bore Hole # 04 (Depth 01 Meter)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88/ASTM C-136/BS-1377 Part 2

Sieve Size		Mass		Cumulative	Specification		
			Retained	Mass	Retained	Passing	Limits
Standard	ndard Alternative		g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in		3" D	owan Materials Gra	dation	
62.5 mm	2 1/2	in					
50.0 mm	2	in		807.4	22.0	78.0	
37.5 mm	1 1/2	in					
25.0 mm	1	in		2035.4	55.4	44.6	
19.0 mm	3/4	in					
12.5 mm	1/2	in		2324.2	63.3	36.7	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			2471.5	67.3	32.7	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			2587.1	70.4	29.6	
1.18 mm	No. 16						
850µm	No. 20						
600 μm	No. 30						
425 μm	No. 40			2986.4	81.3	18.7	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			3347.6	91.1	8.9	
Pan							

TOTAL Weight 3674 Grams



Remarks:	
D_{60}	37.0
D 30	2.4
D ₁₀	0.10
Си	370.0
Сс	1.557
Graval %	67.3
Sand %	23.8
Finer	8.9

Remarks: Sandy Gravel

Tested By

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

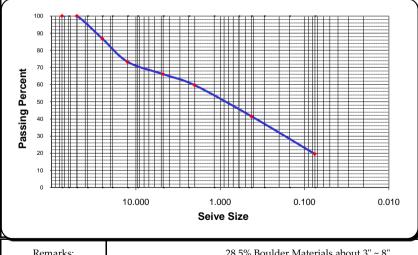
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil invistigation Materials	Testing Date :	19/01/2014
Location :	Bore Hole # 04 (Depth 02 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88/ASTM C-136/BS-1377 Part 2

Sieve Size			Mass		Cumulative		
			Retained	Mass	Retained	Passing	Limits
Standard	rd Alternative		g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in		3" D	owan Materials Gra	adation	
62.5 mm	2 1/2	in					
50.0 mm	2	in		0	0.0	100.0	
37.5 mm	1 1/2	in					
25.0 mm	1	in		320.4	13.2	86.8	
19.0 mm	3/4	in					
12.5 mm	1/2	in		650.3	26.7	73.3	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			823.8	33.9	66.1	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			981.2	40.4	59.6	
1.18 mm	No. 16						
850µm	No. 20						
600 μm	No. 30						
425 μm	No. 40			1420.7	58.4	41.6	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			1957.1	80.5	19.5	
Pan							

2431.7 Grams TOTAL Weight



Remarks:

 D_{60}

 D_{30}

 D_{10}

Си

Cc

Graval % 33.9 Sand % 46.6

19.5 Finer

Remarks: 28.5% Boulder Materials about 3" ~ 8"

Tested By

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

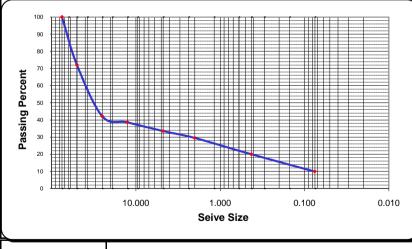
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil Invistigation Materials	Testing Date :	19/01/2014
Location :	Bore Hole # 04 (Depth 03 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88 / ASTM C-136 / BS-1377 Part 2

Sieve Size			Mass		Cumulative		Specification
			Retained	Mass	Retained	Passing	Limits
Standard	Alterr	native	g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in		3" D	owan Materials Gra	dation	
62.5 mm	2 1/2	in					
50.0 mm	2	in		642.8	27.9	72.1	
37.5 mm	1 1/2	in					
25.0 mm	1	in		1336	57.9	42.1	
19.0 mm	3/4	in					
12.5 mm	1/2	in		1417	61.4	38.6	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			1534.2	66.5	33.5	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			1626.4	70.5	29.5	
1.18 mm	No. 16						
850µm	No. 20						
600 μm	No. 30						
425 μm	No. 40			1847.3	80.1	19.9	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			2079.9	90.2	9.8	
Pan							
							<u> </u>

TOTAL Weight 2307 Grams



Remarks: D_{60} 39.7 D_{30} 2.5 0.09 D_{10} Си 441.1 Cc1.749 Graval % 66.5 Sand % 23.7 9.8 Finer

Remarks: Sandy Graval

Tested By Lab Manager (QC)

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

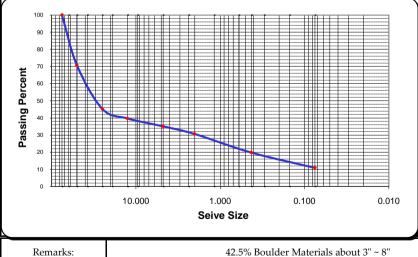
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil Invistigation Materials	Testing Date :	19/01/2014
Location :	Bore Hole # 04 (Depth 04 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88 / ASTM C-136 / BS-1377 Part 2

Sieve Size				Cumulative		
		Retained	Mass	Mass Retained Passing		
d Alternative		g	Retained (g)	%	%	%
4	in					
3	in		3" D	owan Materials Gra	dation	
2 1/2	in					
2	in		797.4	29.2	70.8	
1 1/2	in					
1	in		1494.8	54.7	45.3	
3/4	in					
1/2	in		1647.7	60.3	39.7	
3/8	in					
1/4	in					
No. 4			1773.8	64.9	35.1	
No. 6						
No. 8						
No. 10			1896.2	69.4	30.6	
No. 16						
No. 20						
No. 30						
No. 40			2192.7	80.3	19.7	
No. 50						
No. 80						
No. 100						
No. 200			2434.4	89.1	10.9	
	4 3 2 1/2 2 1 1/2 1 3/4 1/2 3/8 1/4 No. 4 No. 6 No. 8 No. 10 No. 16 No. 20 No. 30 No. 40 No. 50 No. 80 No. 80 No. 100	4 in 3 in 2 1/2 in 2 in 1 1/2 in 1 in 3/4 in 1/2 in 3/8 in 1/4 in No. 4 No. 6 No. 8 No. 10 No. 16 No. 20 No. 30 No. 40 No. 50 No. 80 No. 100	Alternative g 4 in 3 in 2 1/2 in 2 in 1 1/2 in 1 in 3/4 in 1/2 in 3/8 in 1/4 in No. 4 No. 6 No. 8 No. 10 No. 16 No. 20 No. 30 No. 40 No. 50 No. 80 No. 100	Alternative g Retained (g) 4 in 3"Do 2 1/2 in 797.4 1 1/2 in 1494.8 3/4 in 1647.7 3/8 in 1647.7 3/8 in 1773.8 No. 4 1773.8 No. 6 No. 8 No. 10 1896.2 No. 16 No. 20 No. 30 No. 40 2192.7 No. 50 No. 80 No. 100 No. 100	Alternative g Retained (g) % 4 in 3" Dowan Materials Gra 2 1/2 in 797.4 29.2 1 1/2 in 1494.8 54.7 3/4 in 1494.8 54.7 3/4 in 1647.7 60.3 3/8 in 1647.7 60.3 3/8 in 1773.8 64.9 No. 4 1773.8 64.9 No. 6 1896.2 69.4 No. 10 1896.2 69.4 No. 20 No. 30 2192.7 80.3 No. 50 No. 80 No. 100 1896.2 80.3	Alternative g Retained (g) % % 4 in 3" Dowan Materials Gradation 21/2 in 797.4 29.2 70.8 11/2 in 797.4 29.2 70.8 11/2 in 1494.8 54.7 45.3 3/4 in 1647.7 60.3 39.7 3/8 in 1647.7 60.3 39.7 3/8 in 1773.8 64.9 35.1 No. 4 1773.8 64.9 35.1 No. 6 1896.2 69.4 30.6 No. 10 1896.2 69.4 30.6 No. 20 No. 30 19.7 No. 50 No. 80 19.7 No. 80 No. 100 192.7 80.3 19.7

2731.8 Grams TOTAL Weight



Remarks:

 D_{60}

 D_{30}

 D_{10}

Си

Cc

Graval % 64.9

Sand % 24.2 10.9 Finer

42.5% Boulder Materials about 3" ~ 8"

Tested By

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

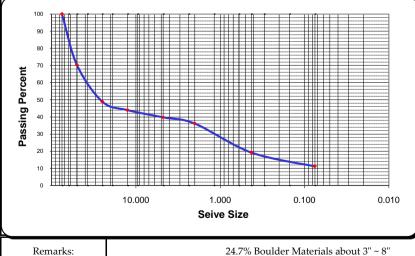
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil Invistigation Materials	Testing Date :	19/01/2014
Location :	Bore Hole # 04 (Depth 05 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88 / ASTM C-136 / BS-1377 Part 2

Sieve Size		Mass	Cumulative			Specification	
			Retained	Mass	Retained	Passing	Limits
Standard	d Alternative		g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in		3" D	owan Materials Gra	dation	
62.5 mm	2 1/2	in					
50.0 mm	2	in		691.6	29.6	70.4	
37.5 mm	1 1/2	in					
25.0 mm	1	in		1194.2	51.1	48.9	
19.0 mm	3/4	in					
12.5 mm	1/2	in		1310.9	56.0	44.0	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			1408.3	60.2	39.8	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			1493.8	63.9	36.1	
1.18 mm	No. 16						
850µm	No. 20						
600 μm	No. 30						
425 μm	No. 40			1890.1	80.8	19.2	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			2078.3	88.9	11.1	
Pan							
-							

2339 Grams TOTAL Weight



Remarks:

 D_{60}

 D_{30}

 D_{10}

Си

Cc

Graval % 60.2

Sand % 28.6

11.1

Finer

24.7% Boulder Materials about 3" ~ 8"

Tested By

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

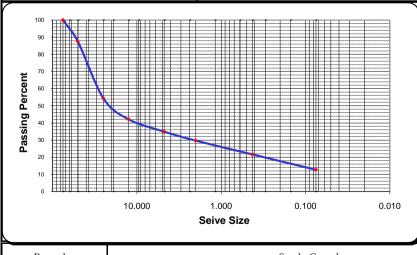
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil Invistigation Materials	Testing Date :	19/01/2014
Location :	Bore Hole # 04 (Depth 06 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88 / ASTM C-136 / BS-1377 Part 2

Sieve Size			Mass		Cumulative		
			Retained	Mass	Retained	Passing	Limits
Standard	tandard Alternative		g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in		3" D	owan Materials Gra	adation	
62.5 mm	2 1/2	in					
50.0 mm	2	in		343.8	12.5	87.5	
37.5 mm	1 1/2	in					
25.0 mm	1	in		1247.9	45.5	54.5	
19.0 mm	3/4	in					
12.5 mm	1/2	in		1585.7	57.9	42.1	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			1782.9	65.1	34.9	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			1928	70.4	29.6	
1.18 mm	No. 16						
850µm	No. 20						
600 μm	No. 30						
425 μm	No. 40			2148.2	78.4	21.6	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			2394.2	87.4	12.6	
Pan							

TOTAL Weight 2740 Grams



Remarks:

 D_{60}

 D_{30}

D 10

D 10

Си

Сс

Graval % 65.1

 Sand %
 22.3

 Finer
 12.6

Remarks: Sandy Graval

Tested By

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

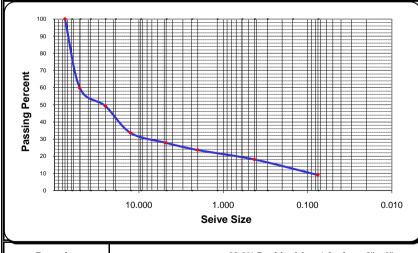
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil Invistigation Materials	Testing Date :	19/01/2014
Location :	Bore Hole # 04 (Depth 07 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88 / ASTM C-136 / BS-1377 Part 2

Sieve Size			Mass	Mass Cumulative			Specification
			Retained	Mass	Mass Retained Passing		
Standard	Alter	native	g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in		3" D	owan Materials Gra	dation	
62.5 mm	2 1/2	in					
50.0 mm	2	in		1164.7	40.2	59.8	
37.5 mm	1 1/2	in					
25.0 mm	1	in		1467.1	50.7	49.3	
19.0 mm	3/4	in					
12.5 mm	1/2	in		1921.2	66.4	33.6	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			2089.4	72.2	27.8	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			2210.9	76.4	23.6	
1.18 mm	No. 16						
850µm	No. 20						
600 μm	No. 30						
425 μm	No. 40			2370	81.9	18.1	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			2632.1	91.0	9.0	
Pan							
Pan							

TOTAL Weight 2894 Grams



Remarks:	
D 60	50.8
D 30	8.4
D 10	1.00
Си	50.8
Сс	1.389
Graval %	72.2
Sand %	18.8
Finer	9.0

Remarks: 22.8% Boulder Materials about $3" \sim 8"$

Tested By Lab Manager (QC)

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

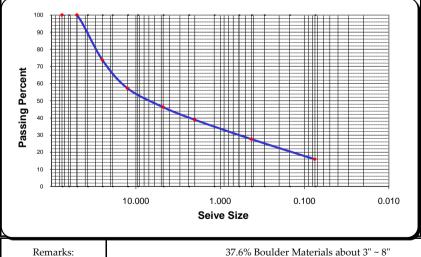
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil Invistigation Materials	Testing Date :	19/01/2014
Location :	Bore Hole # 04 (Depth 08 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88/ASTM C-136/BS-1377 Part 2

Sieve Size			Mass	Cumulative			Specification
			Retained	Mass	Mass Retained Passing		
Standard	andard Alternative		g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in		3" Г	own Materials Gra	dation	
62.5 mm	2 1/2	in					
50.0 mm	2	in		0	0.0	100.0	
37.5 mm	1 1/2	in					
25.0 mm	1	in		613.7	26.2	73.8	
19.0 mm	3/4	in					
12.5 mm	1/2	in		1001.8	42.8	57.2	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			1259.4	53.8	46.2	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			1431	61.1	38.9	
1.18 mm	No. 16						
850µm	No. 20						
600 µm	No. 30						
425 μm	No. 40			1697	72.4	27.6	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			1970.9	84.1	15.9	
Pan							

2343 Grams TOTAL Weight



 D_{60} D_{30} D_{10} Си CcGraval % 53.8 Sand % 30.4

15.9

Remarks:

Finer

Tested By Lab Manager (QC)

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

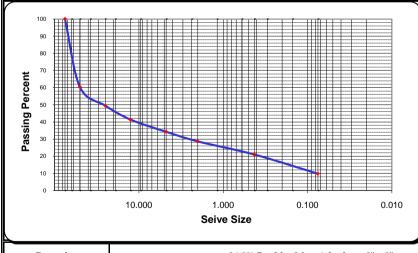
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil invistigation Materials	Testing Date :	19/01/2014
Location :	Bore Hole # 05 (Depth 01 Meter)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88/ASTM C-136/BS-1377 Part 2

Sieve Size			Mass	Cumulative			Specification
			Retained	Mass	Mass Retained Passing		
Standard	ndard Alternative		g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in		3" D	owan Materials Gra	adation	
62.5 mm	2 1/2	in					
50.0 mm	2	in		1121.3	39.6	60.4	
37.5 mm	1 1/2	in					
25.0 mm	1	in		1430.9	50.5	49.5	
19.0 mm	3/4	in					
12.5 mm	1/2	in		1662.2	58.7	41.3	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			1861	65.7	34.3	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			2020.1	71.3	28.7	
1.18 mm	No. 16						
850µm	No. 20						
600 μm	No. 30						
425 μm	No. 40			2238.1	79.0	21.0	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			2555.4	90.2	9.8	
Pan							

TOTAL Weight 2832 Grams



Remarks:	
D_{60}	50.8
D_{30}	2.8
$D_{\ 10}$	0.09
Си	577.3
Сс	1.754
Graval %	65.7
Sand %	24.5
Finer	9.8

Remarks: 26.9% Boulder Materials about $3" \sim 8"$

Tested By Lab Manager (QC)

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

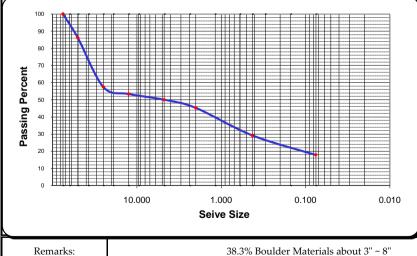
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil invistigation Materials	Testing Date :	19/01/2014
Location :	Bore Hole # 05 (Depth 02 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88 / ASTM C-136 / BS-1377 Part 2

Sieve Size			Mass	Mass Cumulative			Specification
			Retained	Mass	Mass Retained Passing		
Standard	Alter	native	g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in		3" D	owan Materials Gra	dation	
62.5 mm	2 1/2	in					
50.0 mm	2	in		385.1	13.9	86.1	
37.5 mm	1 1/2	in					
25.0 mm	1	in		1175.4	42.5	57.5	
19.0 mm	3/4	in					
12.5 mm	1/2	in		1288.7	46.6	53.4	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			1380.2	49.9	50.1	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			1512.4	54.7	45.3	
1.18 mm	No. 16						
850µm	No. 20						
600 μm	No. 30						
425 μm	No. 40			1957.2	70.8	29.2	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			2271.3	82.2	17.8	
Pan							

TOTAL Weight **2764** Grams



Remarks:

 D_{60}

 D_{30}

 D_{10}

Си

Cc

Graval % 49.9

Sand % 32.2

17.8 Finer

38.3% Boulder Materials about 3" ~ 8"

Tested By

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

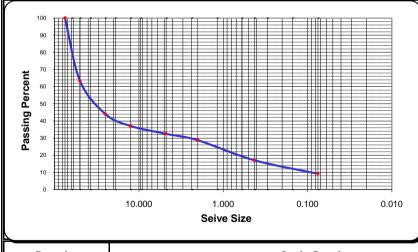
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil Invistigation Materials	Testing Date :	19/01/2014
Location :	Bore Hole # 05 (Depth 03 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88 / ASTM C-136 / BS-1377 Part 2

Sieve Size			Mass	ss Cumulative			Specification
			Retained	Mass	Retained	Passing	Limits
Standard	Alter	native	g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in		3" De	owan Materials Gra	dation	
62.5 mm	2 1/2	in					
50.0 mm	2	in		1661.7	36.5	63.5	
37.5 mm	1 1/2	in					
25.0 mm	1	in		2543.7	55.9	44.1	
19.0 mm	3/4	in					
12.5 mm	1/2	in		2863.8	63.0	37.0	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			3070.4	67.5	32.5	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			3240.1	71.2	28.8	
1.18 mm	No. 16						
850µm	No. 20						
600 μm	No. 30						
425 μm	No. 40			3773.1	83.0	17.0	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			4128.6	90.8	9.2	
Pan							

TOTAL Weight 4548 Grams



Remarks: D_{60} 48.0 D_{30} 2.7 1.00 D_{10} Си 48.0 Cc0.152Graval % 67.5 Sand % 23.3 9.2 Finer

Remarks: Sandy Graval

Tested By Lab Manager (QC)

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

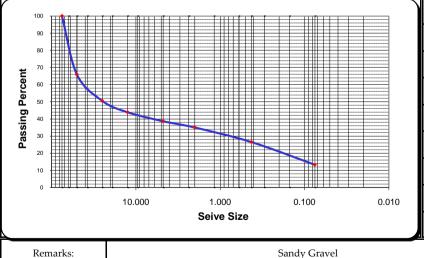
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil Invistigation Materials	Testing Date :	19/01/2014
Location :	Bore Hole # 05 (Depth 04 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88/ASTM C-136/BS-1377 Part 2

Sieve Size			Mass	Cumulative			Specification
			Retained	Mass	Retained	Passing	Limits
Standard	Alter	native	g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in		3" D	owan Materials Gra	adation	
62.5 mm	2 1/2	in					
50.0 mm	2	in		1060.5	34.0	66.0	
37.5 mm	1 1/2	in					
25.0 mm	1	in		1541.4	49.5	50.5	
19.0 mm	3/4	in					
12.5 mm	1/2	in		1747.3	56.1	43.9	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			1910.9	61.3	38.7	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			2025.1	65.0	35.0	
1.18 mm	No. 16						
850µm	No. 20						
600 μm	No. 30						
425 μm	No. 40			2288.4	73.5	26.5	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			2702.1	86.7	13.3	
Pan							

3115 Grams TOTAL Weight



Remarks:

 D_{60}

 D_{30}

 D_{10}

Си

Cc

Graval % 61.3

Sand % 25.4 Finer 13.3

Sandy Gravel

Tested By

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

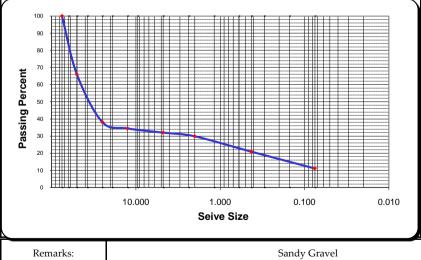
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil Invistigation Materials	Testing Date :	19/01/2014
Location :	Bore Hole # 05 (Depth 05 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88 / ASTM C-136 / BS-1377 Part 2

Sieve Size			Mass	Cumulative			Specification	
				Mass	Retained	Passing	Limits	
Standard	Standard Alternative		g	Retained (g)	%	%	%	
100 mm	4	in						
75.0 mm	3	in		3" D	owan Materials Gra	dation		
62.5 mm	2 1/2	in						
50.0 mm	2	in		1304.1	34.0	66.0		
37.5 mm	1 1/2	in						
25.0 mm	1	in		2373.6	61.8	38.2		
19.0 mm	3/4	in						
12.5 mm	1/2	in		2517.7	65.6	34.4		
9.5 mm	3/8	in						
6.3 mm	1/4	in						
4.75 mm	No. 4			2611.3	68.0	32.0		
3.35 mm	No. 6							
2.36 mm	No. 8							
2.00 mm	No. 10			2694.6	70.2	29.8		
1.18 mm	No. 16							
850µm	No. 20							
600 μm	No. 30							
425 μm	No. 40			3039.1	79.1	20.9		
300 μm	No. 50							
180 μm	No. 80							
150 μm	No. 100							
75 μm	No. 200			3413.7	88.9	11.1		
Pan				1				
			1					

3840 Grams TOTAL Weight



Remarks:

 D_{60}

 D_{30}

 D_{10}

Си

Cc

Graval % 68.0

Sand % 20.9 Finer 11.1

Tested By

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

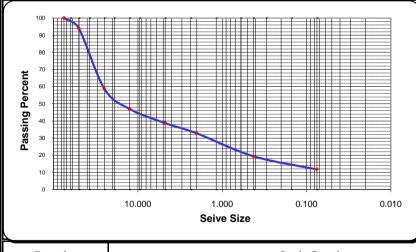
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil Invistigation Materials	Testing Date :	19/01/2014
Location :	Bore Hole # 05 (Depth 06 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88/ASTM C-136/BS-1377 Part 2

Sieve Size			Mass	Cumulative			Specification
			Retained	Mass	Retained	Passing	Limits
Standard	tandard Alternative		g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in		3" D	owan Materials Gr	adation	
62.5 mm	2 1/2	in					
50.0 mm	2	in		223.3	6.1	93.9	
37.5 mm	1 1/2	in					
25.0 mm	1	in		1515	41.2	58.8	
19.0 mm	3/4	in					
12.5 mm	1/2	in		1951.9	53.1	46.9	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			2253.6	61.3	38.7	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			2474	67.3	32.7	
1.18 mm	No. 16						
850µm	No. 20						
600 μm	No. 30						
425 μm	No. 40			2965	80.6	19.4	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			3246	88.3	11.7	
Pan					_		

TOTAL Weight 3677 Grams



Remarks:	
D 60	27.0
D_{30}	1.7
D_{10}	0.1
Си	415.4
Сс	1.647
Graval %	61.3
Sand %	27.0
Finer	11.7

Remarks: Sandy Graval

Tested By Lab Manager (QC)

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

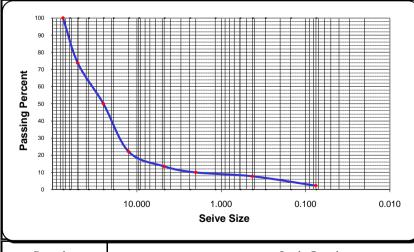
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil Invistigation Materials	Testing Date :	19/01/2014
Location :	Bore Hole # 05 (Depth 07 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88/ASTM C-136/BS-1377 Part 2

Sieve Size			Mass	Cumulative			Specification
			Retained	Mass	Retained	Passing	Limits
Standard	tandard Alternative		g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in		3" D	owan Materials Gra	dation	
62.5 mm	2 1/2	in					
50.0 mm	2	in		979.8	26.3	73.7	
37.5 mm	1 1/2	in					
25.0 mm	1	in		1855.7	49.8	50.2	
19.0 mm	3/4	in					
12.5 mm	1/2	in		2899.4	77.9	22.1	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			3221.8	86.5	13.5	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			3353.5	90.1	9.9	
1.18 mm	No. 16						
850µm	No. 20						
600 μm	No. 30						
425 μm	No. 40			3437.4	92.3	7.7	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			3642.1	97.8	2.2	
Pan							

TOTAL Weight 3724 Grams



Remarks: D_{60} 33.0 D_{30} 17.0 2.60 D_{10} Си 12.7 Cc3.368 Graval % 86.5 Sand % 11.3 2.2 Finer

Remarks: Sandy Gravel

Tested By Lab Manager (QC)

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

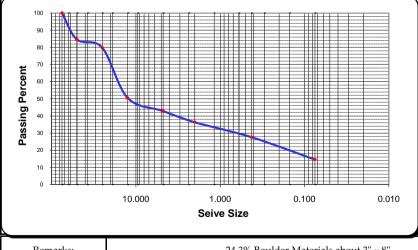
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil Invistigation Materials	Testing Date :	19/01/2014
Location :	Bore Hole # 05 (Depth 08 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88/ASTM C-136/BS-1377 Part 2

Sieve Size			Mass	Cumulative			Specification	
			Retained	Mass	Mass Retained Passing			
Standard	tandard Alternative		g	Retained (g)	%	%	%	
100 mm	4	in						
75.0 mm	3	in		3" D	owan Materials Gra	adation		
62.5 mm	2 1/2	in						
50.0 mm	2	in		462.4	15.4	84.6		
37.5 mm	1 1/2	in						
25.0 mm	1	in		609.3	20.2	79.8		
19.0 mm	3/4	in						
12.5 mm	1/2	in		1490.2	49.5	50.5		
9.5 mm	3/8	in						
6.3 mm	1/4	in						
4.75 mm	No. 4			1721.9	57.2	42.8		
3.35 mm	No. 6							
2.36 mm	No. 8							
2.00 mm	No. 10			1916.8	63.7	36.3		
1.18 mm	No. 16							
850µm	No. 20							
600 μm	No. 30							
425 μm	No. 40			2178.6	72.4	27.6		
300 μm	No. 50							
180 μm	No. 80							
150 μm	No. 100							
75 μm	No. 200			2573.3	85.5	14.5		
Pan								

TOTAL Weight 3010 Grams



D₆₀

D₃₀

D₁₀

Cu

Cc

Graval % 57.2

Remarks:

 Sand %
 28.3

 Finer
 14.5

Remarks: 24.3% Boulder Materials about $3" \sim 8"$

Tested By

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

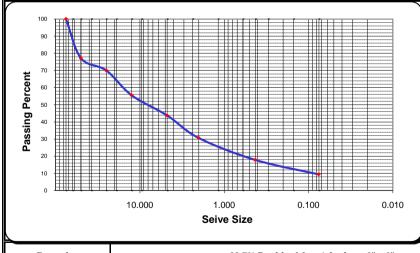
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil invistigation Materials	Testing Date :	19/01/2014
Location :	Bore Hole # 06 (Depth 01 Meter)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88/ASTM C-136/BS-1377 Part 2

				Cumulative			Specification
			Retained	Mass	Mass Retained Passing		
Standard	d Alternative		g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in		3" D	owan Materials Gra	dation	
62.5 mm	2 1/2	in					
50.0 mm	2	in		669.5	22.8	77.2	
37.5 mm	1 1/2	in					
25.0 mm	1	in		880.6	30.0	70.0	
19.0 mm	3/4	in					
12.5 mm	1/2	in		1304.1	44.4	55.6	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			1649	56.2	43.8	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			2038.1	69.4	30.6	
1.18 mm	No. 16						
850µm	No. 20						
600 μm	No. 30						
425 μm	No. 40			2413.8	82.2	17.8	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			2660.5	90.6	9.4	
Pan							

TOTAL Weight 2935 Grams



Remarks:	
D_{60}	18.0
D_{30}	2.0
D_{10}	0.10
Си	180.0
Сс	2.222
Graval %	56.2
Sand %	34.5
Finer	9.4

Remarks: 32.7% Boulder Materials about $3" \sim 8"$

Tested By Lab Manager (QC)

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil invistigation Materials	Testing Date :	19/01/2014
Location :	Bore Hole # 06 (Depth 02 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88/ASTM C-136/BS-1377 Part 2

Sieve Size			Mass		Cumulative		Specification
			Retained	Mass	Mass Retained Passing		
Standard	Alternative		g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in		3" D	owan Materials Gra	adation	
62.5 mm	2 1/2	in					
50.0 mm	2	in		0	0.0	100.0	
37.5 mm	1 1/2	in					
25.0 mm	1	in		342.1	12.3	87.7	
19.0 mm	3/4	in					
12.5 mm	1/2	in		709.2	25.6	74.4	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			1017.6	36.7	63.3	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			1403.8	50.6	49.4	
1.18 mm	No. 16						
850µm	No. 20						
600 μm	No. 30						
425 μm	No. 40			1763.2	63.6	36.4	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			1958.6	70.6	29.4	
Pan							

TOTAL Weight 2773 Grams



D 60

D 30

D 10

Remarks:

Си

Cc
Graval % 36.7

 Sand %
 33.9

 Finer
 29.4

Remarks: 25.5% Boulder Materials about $3" \sim 8"$

Tested By

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

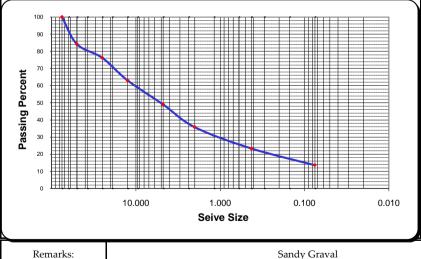
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil Invistigation Materials	Testing Date :	19/01/2014
Location :	Bore Hole # 06 (Depth 03 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88/ASTM C-136/BS-1377 Part 2

Sieve Size		Mass	ss Cumulative			Specification	
			Retained	Mass	Mass Retained Passing		
Standard	Alternative		g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in		3" D	owan Materials Gr	adation	
62.5 mm	2 1/2	in					
50.0 mm	2	in		540.9	15.8	84.2	
37.5 mm	1 1/2	in					
25.0 mm	1	in		814.1	23.8	76.2	
19.0 mm	3/4	in					
12.5 mm	1/2	in		1265.3	37.0	63.0	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			1745.3	51.0	49.0	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			2200.8	64.3	35.7	
1.18 mm	No. 16						
850µm	No. 20						
600 μm	No. 30						
425 μm	No. 40			2625.1	76.7	23.3	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			2957	86.4	13.6	
Pan							

3423 Grams TOTAL Weight



 D_{60} D_{30} D_{10} Си CcGraval % 51.0

Remarks:

Sand % 35.4 Finer 13.6

Sandy Graval

Tested By Lab Manager (QC)

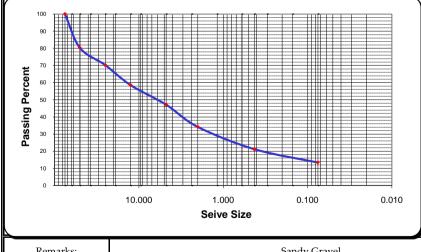
Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil Invistigation Materials	Testing Date :	19/01/2014
Location :	Bore Hole # 06 (Depth 04 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

Retained Retained Retained Retained Retained (g) % % % % % % % % %	Sieve Size		Mass	Cumulative			Specification	
100 mm				Retained	Mass	Mass Retained Passing		
100 mm	Standard	rd Alternative		g	Retained (g)	%	%	%
62.5 mm	100 mm	4	in					
50.0 mm 2	75.0 mm	3	in		3" D	owan Materials Gra	dation	
37.5 mm	62.5 mm	2 1/2	in					
25.0 mm	50.0 mm	2	in		741.7	19.7	80.3	
19.0 mm 3/4 in 1560.4 41.4 58.6 9.5 mm 1/2 in 1560.4 41.4 58.6 9.5 mm 3/8 in 14.75 mm No. 4 1993 52.9 47.1 3.35 mm No. 6 2.36 mm No. 8 2.00 mm No. 10 2481 65.9 34.1 1.18 mm No. 16 850μm No. 20 600 μm No. 30 425 μm No. 40 2970.4 78.9 21.1 300 μm No. 50 180 μm No. 80	37.5 mm	1 1/2	in					
12.5 mm 1/2 in 1560.4 41.4 58.6 9.5 mm 3/8 in 1 4.75 mm No. 4 1993 52.9 47.1 3.35 mm No. 6 2.36 mm No. 10 2481 65.9 34.1 1.18 mm No. 16 850μm No. 20 600 μm No. 30 425 μm No. 40 2970.4 78.9 21.1 300 μm No. 50 180 μm No. 80	25.0 mm	1	in		1123.2	29.8	70.2	
9.5 mm 3/8 in 6.3 mm 1/4 in 1993 52.9 47.1 3.35 mm No. 6 2.36 mm No. 8 2.00 mm No. 10 2481 65.9 34.1 1.18 mm No. 16 850μm No. 20 600 μm No. 30 425 μm No. 40 2970.4 78.9 21.1 300 μm No. 50 180 μm No. 80	19.0 mm	3/4	in					
6.3 mm 1/4 in 4.75 mm No. 4 1993 52.9 47.1 3.35 mm No. 6 2.36 mm No. 8 2.00 mm No. 10 2481 65.9 34.1 1.18 mm No. 16 850μm No. 20 600 μm No. 30 425 μm No. 40 2970.4 78.9 21.1 300 μm No. 50 180 μm No. 80	12.5 mm	1/2	in		1560.4	41.4	58.6	
4.75 mm No. 4 1993 52.9 47.1 3.35 mm No. 6 2.36 mm No. 8 2.00 mm No. 10 2481 65.9 34.1 1.18 mm No. 16 850μm No. 20 600 μm No. 30 425 μm No. 40 2970.4 78.9 21.1 300 μm No. 50 180 μm No. 80	9.5 mm	3/8	in					
3.35 mm No. 6 2.36 mm No. 8 2.00 mm No. 10 1.18 mm No. 16 850μm No. 20 600 μm No. 30 425 μm No. 40 300 μm No. 50 180 μm No. 80	6.3 mm	1/4	in					
2.36 mm No. 8 2.00 mm No. 10 1.18 mm No. 16 850μm No. 20 600 μm No. 30 425 μm No. 40 300 μm No. 50 180 μm No. 80	4.75 mm	No. 4			1993	52.9	47.1	
2.00 mm	3.35 mm	No. 6						
1.18 mm No. 16 850μm No. 20 600 μm No. 30 425 μm No. 40 2970.4 78.9 21.1 300 μm No. 50 180 μm No. 80	2.36 mm	No. 8						
850μm No. 20 600 μm No. 30 425 μm No. 40 300 μm No. 50 180 μm No. 80	2.00 mm	No. 10			2481	65.9	34.1	
600 μm No. 30 2970.4 78.9 21.1 300 μm No. 50 180 μm No. 80	1.18 mm	No. 16						
425 μm No. 40 2970.4 78.9 21.1 300 μm No. 50 180 μm No. 80	850µm	No. 20						
300 μm No. 50 180 μm No. 80	600 μm	No. 30						
180 μm No. 80	425 μm	No. 40			2970.4	78.9	21.1	
'	300 μm	No. 50						
150 μm No. 100	180 μm	No. 80						
	150 μm	No. 100						
75 μm No. 200 3263 86.6 13.4	75 μm	No. 200			3263	86.6	13.4	
Pan	Pan							

3767 Grams TOTAL Weight



Remarks:

 D_{60}

 D_{30}

D 10

Си

Cc

Graval % 52.9

Sand % 33.7

Finer 13.4

Remarks: Sandy Gravel

Tested By

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

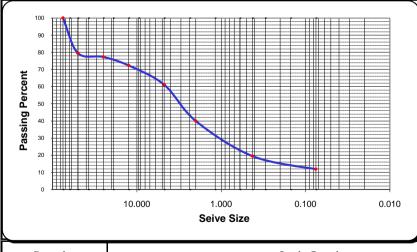
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil Invistigation Materials	Testing Date :	19/01/2014
Location :	Bore Hole # 06 (Depth 05 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88/ASTM C-136/BS-1377 Part 2

Sieve Size Standard Alternative		Mass	Mass Cumulative			Specification	
		Retained	Mass	Retained	Passing	Limits	
		g	Retained (g)	%	%	%	
100 mm	4	in					
75.0 mm	3	in		3" D	owan Materials Gra	dation	
62.5 mm	2 1/2	in					
50.0 mm	2	in		616.7	20.4	79.6	
37.5 mm	1 1/2	in					
25.0 mm	1	in		684.9	22.7	77.3	
19.0 mm	3/4	in					
12.5 mm	1/2	in		835.8	27.7	72.3	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			1174.9	38.9	61.1	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			1814	60.0	40.0	
1.18 mm	No. 16						
850µm	No. 20						
600 μm	No. 30						
425 μm	No. 40			2432.4	80.5	19.5	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			2663.9	88.2	11.8	
Pan							

TOTAL Weight 3022 Grams



Remarks:

 D_{60}

 D_{30}

 D_{10}

Си

Си

Cc
Graval % 38.9

Sand % 49.3

Finer 11.8

Remarks: Sandy Gravel

Tested By

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

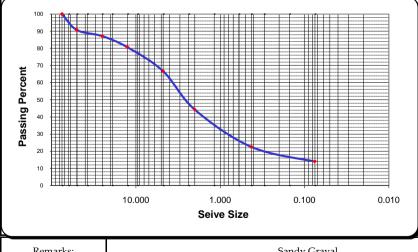
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil Invistigation Materials	Testing Date :	19/01/2014
Location :	Bore Hole # 06 (Depth 06 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88/ASTM C-136/BS-1377 Part 2

Sieve Size		Mass		Cumulative		Specification	
		Retained	Mass	Retained	Passing	Limits	
Standard	d Alternative		g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in		3" D	owan Materials Gr	adation	
62.5 mm	2 1/2	in					
50.0 mm	2	in		262.1	9.3	90.7	
37.5 mm	1 1/2	in					
25.0 mm	1	in		362.5	12.9	87.1	
19.0 mm	3/4	in					
12.5 mm	1/2	in		545.7	19.4	80.6	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			934.7	33.3	66.7	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			1563.5	55.7	44.3	
1.18 mm	No. 16						
850µm	No. 20						
600 μm	No. 30						
425 μm	No. 40			2175.3	77.5	22.5	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			2413.1	86.0	14.0	
Pan							

2806 Grams TOTAL Weight



Remarks:

 D_{60} D_{30}

 D_{10}

Си

Cc

Graval % 33.3

Sand % 52.7 Finer 14.0

Remarks: Sandy Graval

Tested By

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

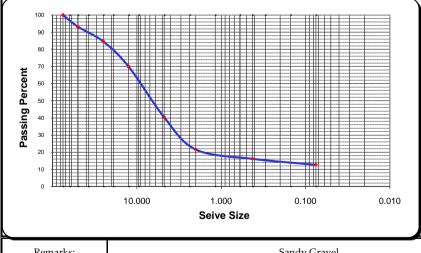
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil Invistigation Materials	Testing Date :	19/01/2014
Location :	Bore Hole # 06 (Depth 07 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88 / ASTM C-136 / BS-1377 Part 2

Sieve Size		Mass		Cumulative		Specification	
		Retained	Mass	Retained	Passing	Limits	
Standard	Alteri	native	g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in		3" D	owan Materials Gra	dation	
62.5 mm	2 1/2	in					
50.0 mm	2	in		217.4	6.8	93.2	
37.5 mm	1 1/2	in					
25.0 mm	1	in		495.7	15.4	84.6	
19.0 mm	3/4	in					
12.5 mm	1/2	in		967.2	30.1	69.9	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			1913.8	59.6	40.4	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			2518.7	78.4	21.6	
1.18 mm	No. 16						
850µm	No. 20						
600 μm	No. 30						
425 μm	No. 40			2693.5	83.9	16.1	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			2804.1	87.3	12.7	
Pan							

3212 Grams TOTAL Weight



 D_{60} D_{30} D_{10} Си CcGraval % 59.6 Sand % 27.7

12.7

Remarks:

Finer

Remarks: Sandy Gravel

Tested By Lab Manager (QC)

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

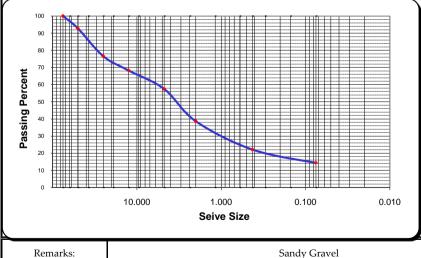
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil Invistigation Materials	Testing Date :	19/01/2014
Location :	Bore Hole # 06 (Depth 08 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88/ASTM C-136/BS-1377 Part 2

Standard Alter 100 mm 4 75.0 mm 3	native in in	Retained g	Mass Retained (g)	Retained	Passing	Limits
100 mm 4	in	g	Retained (g)	0/		
				%	%	%
75.0	·					
/5.0 mm 3	ın		3" D	owan Materials Gra	dation	
62.5 mm 2 1/2	in					
50.0 mm 2	in		219	7.2	92.8	
37.5 mm 1 1/2	in					
25.0 mm 1	in		716.3	23.4	76.6	
19.0 mm 3/4	in					
12.5 mm 1/2	in		969.4	31.7	68.3	
9.5 mm 3/8	in					
6.3 mm 1/4	in					
4.75 mm No. 4			1298	42.5	57.5	
3.35 mm No. 6						
2.36 mm No. 8						
2.00 mm No. 10			1876.5	61.4	38.6	
1.18 mm No. 16						
850μm No. 20						
600 μm No. 30						
425 μm No. 40			2382.1	77.9	22.1	
300 μm No. 50						
180 μm No. 80						
150 μm No. 100						
75 μm No. 200			2617.1	85.6	14.4	
Pan						

3057 Grams TOTAL Weight



Remarks:

 D_{60}

 D_{30}

 D_{10}

Си

Cc

Graval % 42.5 Sand % 43.2

Finer 14.4

Sandy Gravel

Tested By

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil invistigation Materials	Testing Date :	20/01/2014
Location :	Bore Hole # 07 (Depth 01 Meter)	Sampled By:	KA Rep,

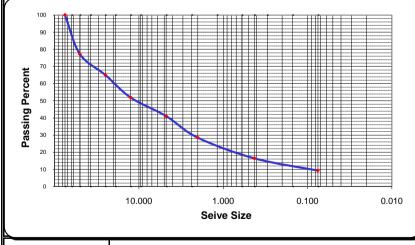
SIEVE ANALYSIS

AASHTO T-27, T-88/ASTM C-136/BS-1377 Part 2

Sieve Size		Mass		Cumulative		Specification	
		Retained	Mass	Retained	Passing	Limits	
Standard	tandard Alternative		g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in		3" D	owan Materials Gra	dation	
62.5 mm	2 1/2	in					
50.0 mm	2	in		728.1	22.8	77.2	
37.5 mm	1 1/2	in					
25.0 mm	1	in		1117.5	34.9	65.1	
19.0 mm	3/4	in					
12.5 mm	1/2	in		1539.4	48.1	51.9	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			1884.1	58.9	41.1	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			2289.7	71.6	28.4	
1.18 mm	No. 16						
850µm	No. 20						
600 μm	No. 30						
425 μm	No. 40			2675.3	83.6	16.4	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			2901.6	90.7	9.3	
Pan							

TOTAL Weight

3199 Grams



D₆₀ 20.0
D₃₀ 2.3

Remarks:

 D 10
 0.12

 Cu
 166.7

 Cc
 2.204

 Graval %
 58.9

 Sand %
 31.8

 Finer
 9.3

Remarks:

21.1% Boulder Materials about 3" ~ 8"

Tested By

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

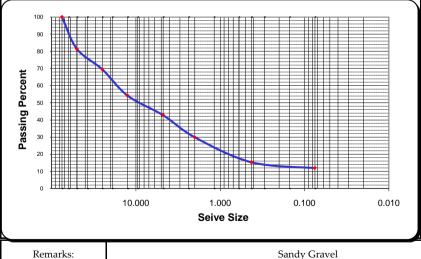
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil invistigation Materials	Testing Date :	20/01/2014
Location :	Bore Hole # 07 (Depth 02 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88/ASTM C-136/BS-1377 Part 2

Sieve Size		Mass		Cumulative		Specification	
			Retained	Mass	Retained	Passing	Limits
Standard	andard Alternative		g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in		3" D	owan Materials Gra	dation	
62.5 mm	2 1/2	in					
50.0 mm	2	in		637.7	18.6	81.4	
37.5 mm	1 1/2	in					
25.0 mm	1	in		1047.7	30.5	69.5	
19.0 mm	3/4	in					
12.5 mm	1/2	in		1574.4	45.9	54.1	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			1966.6	57.3	42.7	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			2407.1	70.1	29.9	
1.18 mm	No. 16						
850µm	No. 20						
600 μm	No. 30						
425 μm	No. 40			2906.5	84.7	15.3	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			3024.4	88.1	11.9	
Pan							

3432 Grams TOTAL Weight



 D_{60} D_{30} D_{10}

Remarks:

Си CcGraval % 57.3

Sand % 30.8 11.9 Finer

Sandy Gravel

Tested By Lab Manager (QC)

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

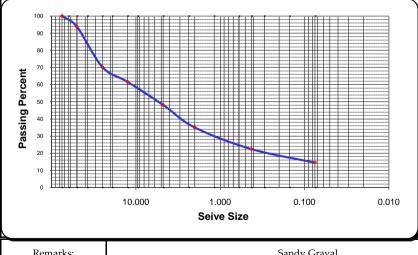
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil Invistigation Materials	Testing Date :	20/01/2014
Location :	Bore Hole # 07 (Depth 03 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88 / ASTM C-136 / BS-1377 Part 2

Standard Alternative g Mass Retained (g) Retained % Passing % 100 mm 4 in 3" Down Materials Gradation 75.0 mm 3 in 3" Down Materials Gradation 62.5 mm 2 1/2 in 195.4 6.2 93.8 37.5 mm 1 1/2 in 940.2 29.7 70.3 19.0 mm 3/4 in 1940.2 29.7 70.3	Limits %
100 mm 4 in 3" Dowan Materials Gradation 75.0 mm 3 in 3" Dowan Materials Gradation 62.5 mm 2 1/2 in 195.4 6.2 93.8 37.5 mm 1 1/2 in 10.2 10.2 10.3<	%
100 mm 4 in 3" Dowan Materials Gradation 75.0 mm 3 in 3" Dowan Materials Gradation 62.5 mm 2 1/2 in 195.4 6.2 93.8 37.5 mm 1 1/2 in 10	
62.5 mm 2 1/2 in 195.4 6.2 93.8 37.5 mm 1 1/2 in 195.4 6.2 93.8 25.0 mm 1 in 940.2 29.7 70.3 19.0 mm 3/4 in 940.2 29.7 70.3	
50.0 mm 2 in 195.4 6.2 93.8 37.5 mm 1 1/2 in 940.2 29.7 70.3 19.0 mm 3/4 in 940.2 29.7 70.3	
37.5 mm 1 1/2 in 25.0 mm 1 in 940.2 29.7 70.3 19.0 mm 3/4 in	
25.0 mm 1 in 940.2 29.7 70.3 19.0 mm 3/4 in	
19.0 mm 3/4 in	
12.5 mm 1/2 in 1214.8 38.4 61.6	
9.5 mm 3/8 in	
6.3 mm 1/4 in	
4.75 mm No. 4 1638.3 51.8 48.2	
3.35 mm No. 6	
2.36 mm No. 8	
2.00 mm No. 10 2055.4 65.0 35.0	
1.18 mm No. 16	
850μm No. 20	
600 μm No. 30	
425 μm No. 40 2453.1 77.6 22.4	
300 μm No. 50	
180 μm No. 80	
150 μm No. 100	
75 μm No. 200 2701.4 85.4 14.6	
Pan	

3162 Grams TOTAL Weight



Remarks:

 D_{60}

 D_{30}

 D_{10}

Си

Cc

Graval % 51.8 Sand % 33.6

Finer 14.6

Remarks: Sandy Graval

Tested By

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

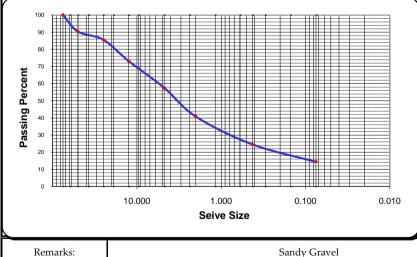
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil Invistigation Materials	Testing Date :	20/01/2014
Location :	Bore Hole # 07 (Depth 04 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88/ASTM C-136/BS-1377 Part 2

Sieve Size			Mass		Cumulative		Specification
			Retained	Mass	Retained	Passing	Limits
Standard	Alternati	ve	g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in		3" D	owan Materials Gra	adation	
62.5 mm	2 1/2	in					
50.0 mm	2	in		298	9.6	90.4	
37.5 mm	1 1/2	in					
25.0 mm	1	in		444.7	14.3	85.7	
19.0 mm	3/4	in					
12.5 mm	1/2	in		830.4	26.8	73.2	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			1313	42.4	57.6	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			1834.4	59.2	40.8	
1.18 mm	No. 16						
850µm	No. 20						
600 μm	No. 30						
425 μm	No. 40			2339.1	75.5	24.5	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			2651.3	85.6	14.4	
Pan							

3099 Grams TOTAL Weight



 D_{60} D_{30} D_{10} Си CcGraval % 42.4

Remarks:

Sand %

43.2 Finer 14.4

Sandy Gravel

Tested By

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

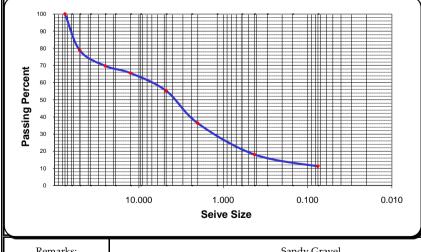
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil Invistigation Materials	Testing Date :	20/01/2014
Location :	Bore Hole # 07 (Depth 05 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88/ASTM C-136/BS-1377 Part 2

Sieve Size			Mass		Cumulative		Specification
			Retained	Mass	Retained	Passing	Limits
Standard	Alterna	tive	g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in		3" D	owan Materials Gra	adation	
62.5 mm	2 1/2	in					
50.0 mm	2	in		783.5	21.3	78.7	
37.5 mm	1 1/2	in					
25.0 mm	1	in		1113.1	30.2	69.8	
19.0 mm	3/4	in					
12.5 mm	1/2	in		1267.3	34.4	65.6	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			1647.5	44.8	55.2	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			2346.1	63.7	36.3	
1.18 mm	No. 16						
850µm	No. 20						
600 μm	No. 30						
425 μm	No. 40			3016.4	81.9	18.1	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			3270.1	88.8	11.2	
Pan							

3681 Grams TOTAL Weight



Remarks:

 D_{60}

 D_{30}

 D_{10}

Си

Cc

Graval % 44.8

Sand % 44.1 11.2 Finer

Remarks: Sandy Gravel

Tested By

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

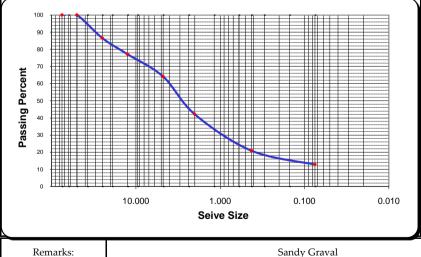
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil Invistigation Materials	Testing Date :	20/01/2014
Location :	Bore Hole # 07 (Depth 06 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88 / ASTM C-136 / BS-1377 Part 2

Sieve Size			Mass		Cumulative		
	Standard Alternative		Retained	Mass	Retained	Passing	Limits
Standard			g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in		3" D	owan Materials Gra	dation	
62.5 mm	2 1/2	in					
50.0 mm	2	in		0	0.0	100.0	
37.5 mm	1 1/2	in					
25.0 mm	1	in		439.2	13.4	86.6	
19.0 mm	3/4	in					
12.5 mm	1/2	in		746.6	22.8	77.2	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			1172.4	35.9	64.1	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			1893.7	57.9	42.1	
1.18 mm	No. 16						
850µm	No. 20						
600 μm	No. 30						
425 μm	No. 40			2587.1	79.1	20.9	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			2848	87.1	12.9	
Pan							
			- i	•			

3269 Grams TOTAL Weight



 D_{60} D_{30} D_{10} Си CcGraval % 35.9 Sand % 51.3

Remarks:

Finer

Sandy Graval

Tested By

Lab Manager (QC)

12.9

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

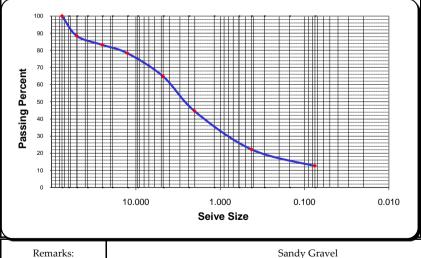
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil Invistigation Materials	Testing Date :	20/01/2014
Location :	Bore Hole # 07 (Depth 07 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88 / ASTM C-136 / BS-1377 Part 2

Sieve Size		Mass		Cumulative		Specification	
			Retained	Mass	Retained	Passing	Limits
Standard	Alter	native	g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in		3" De	owan Materials Gra	dation	
62.5 mm	2 1/2	in					
50.0 mm	2	in		396.2	11.7	88.3	
37.5 mm	1 1/2	in					
25.0 mm	1	in		571.6	16.8	83.2	
19.0 mm	3/4	in					
12.5 mm	1/2	in		738.4	21.7	78.3	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			1196.1	35.2	64.8	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			1887.4	55.6	44.4	
1.18 mm	No. 16						
850µm	No. 20						
600 μm	No. 30						
425 μm	No. 40			2642.9	77.8	22.2	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			2969.6	87.4	12.6	
Pan							

3396 Grams TOTAL Weight



Remarks:

 D_{60}

 D_{30}

 D_{10}

Си

Cc

Graval % 35.2 Sand % 52.2

Finer 12.6

Sandy Gravel

Tested By

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

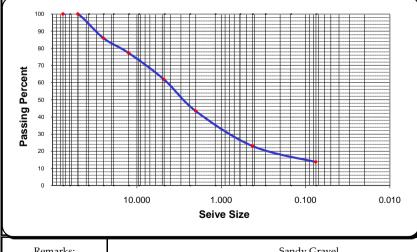
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil Invistigation Materials	Testing Date :	20/01/2014
Location :	Bore Hole # 07 (Depth 08 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88/ASTM C-136/BS-1377 Part 2

Sieve Size			Mass		Cumulative		
			Retained	Mass	Retained	Passing	Limits
Standard	Alter	native	g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in		3" D	owan Materials Gra	adation	
62.5 mm	2 1/2	in					
50.0 mm	2	in		0	0.0	100.0	
37.5 mm	1 1/2	in					
25.0 mm	1	in		471.5	14.0	86.0	
19.0 mm	3/4	in					
12.5 mm	1/2	in		765.5	22.7	77.3	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			1289.3	38.2	61.8	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			1910.9	56.6	43.4	
1.18 mm	No. 16						
850µm	No. 20						
600 μm	No. 30						
425 μm	No. 40			2600.1	77.0	23.0	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			2915.3	86.3	13.7	
Pan							

3377 Grams TOTAL Weight



Remarks:

 D_{60}

 D_{30}

 D_{10}

Си

Cc

Graval % 38.2

Sand % 48.1 13.7 Finer

Remarks: Sandy Gravel

Tested By

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

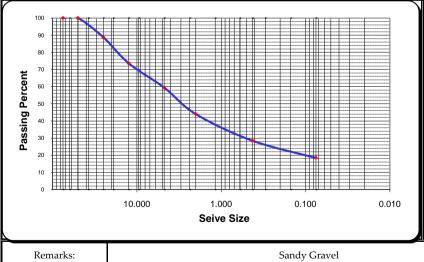
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil invistigation Materials	Testing Date :	20/01/2014
Location :	Bore Hole # 08 (Depth 01 Meter)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88 / ASTM C-136 / BS-1377 Part 2

Sieve Size			Mass		Cumulative		
	Standard Alternative		Retained	Mass	Retained	Passing %	Limits
Standard			g	Retained (g)	%		%
100 mm	4	in					
75.0 mm	3	in		3" D	owan Materials Gra	dation	
62.5 mm	2 1/2	in					
50.0 mm	2	in		0	0.0	100.0	
37.5 mm	1 1/2	in					
25.0 mm	1	in		410.5	11.2	88.8	
19.0 mm	3/4	in					
12.5 mm	1/2	in		969.2	26.4	73.6	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			1490.7	40.5	59.5	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			2061.1	56.0	44.0	
1.18 mm	No. 16						
850µm	No. 20						
600 µm	No. 30						
425 μm	No. 40			2632.4	71.6	28.4	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			2998.1	81.5	18.5	
Pan							

3678 Grams TOTAL Weight



Remarks:

 D_{60}

 D_{30}

 D_{10}

Си

Cc

Finer

Graval % 40.5

Sand % 41.0

18.5

Tested By

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

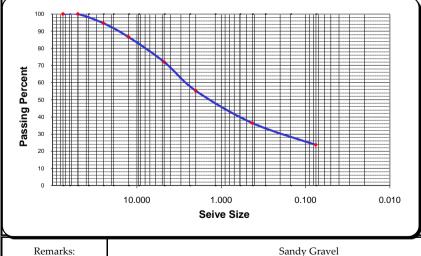
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil invistigation Materials	Testing Date :	20/01/2014
Location :	Bore Hole # 08 (Depth 02 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88/ASTM C-136/BS-1377 Part 2

Sieve Size		Mass	Cumulative			Specification	
		Retained	Mass	Retained	Passing	Limits	
Standard	d Alternative		g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in		3" Dowan Materials Gradation			
62.5 mm	2 1/2	in					
50.0 mm	2	in		0	0.0	100.0	
37.5 mm	1 1/2	in					
25.0 mm	1	in		144.5	5.3	94.7	
19.0 mm	3/4	in					
12.5 mm	1/2	in		364	13.4	86.6	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			756.6	27.9	72.1	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			1214.9	44.8	55.2	
1.18 mm	No. 16						
850µm	No. 20						
600 μm	No. 30						
425 μm	No. 40			1725.2	63.6	36.4	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			2071.1	76.3	23.7	
Pan							

2714 Grams TOTAL Weight



Remarks:

 D_{60} D_{30}

 D_{10}

Си

Cc

Graval % 27.9

Sand % 48.4

23.7

Finer

Sandy Gravel

Tested By

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

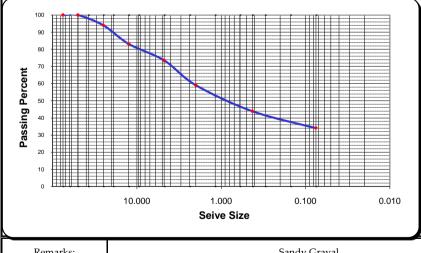
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil Invistigation Materials	Testing Date :	20/01/2014
Location :	Bore Hole # 08 (Depth 03 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88/ASTM C-136/BS-1377 Part 2

Sieve Size		Mass	Cumulative			Specification	
			Retained	Mass	Retained	Passing	Limits
Standard	Alter	native	g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in					
62.5 mm	2 1/2	in					
50.0 mm	2	in		0	0.0	100.0	
37.5 mm	1 1/2	in					
25.0 mm	1	in		143.3	6.0	94.0	
19.0 mm	3/4	in					
12.5 mm	1/2	in		402.7	16.8	83.2	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			635.2	26.5	73.5	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			982	40.9	59.1	
1.18 mm	No. 16						
850µm	No. 20						
600 µm	No. 30						
425 μm	No. 40			1347.4	56.1	43.9	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			1583	65.9	34.1	
Pan							

2400.7 Grams TOTAL Weight



Remarks:

 D_{60} D_{30}

 D_{10}

Си

Cc

Graval % 26.5

Sand % 39.5 Finer 34.1

Remarks: Sandy Graval

Tested By

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

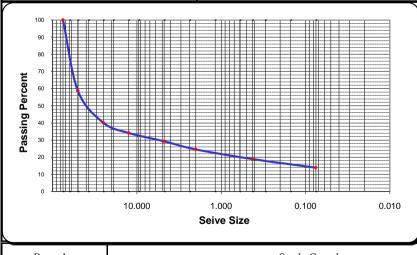
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil Invistigation Materials	Testing Date :	20/01/2014
Location :	Bore Hole # 08 (Depth 04 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88/ASTM C-136/BS-1377 Part 2

		Sieve Size		Cumulative			Specification
			Retained	Mass	Retained	Passing	Limits
Standard	ndard Alternative		g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in		3" D	owan Materials Gra	dation	
62.5 mm	2 1/2	in					
50.0 mm	2	in		1727.3	41.2	58.8	
37.5 mm	1 1/2	in					
25.0 mm	1	in		2506.2	59.8	40.2	
19.0 mm	3/4	in					
12.5 mm	1/2	in		2759	65.9	34.1	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			2962.3	70.7	29.3	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			3161.4	75.5	24.5	
1.18 mm	No. 16						
850µm	No. 20						
600 μm	No. 30						
425 μm	No. 40			3395.5	81.1	18.9	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			3606.9	86.1	13.9	
Pan							

TOTAL Weight 4188 Grams



Remarks:

 D_{60}

 D_{30}

D 10

Си

Сс

Graval % 70.7

 Sand %
 15.4

 Finer
 13.9

Remarks: Sandy Gravel

Tested By

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

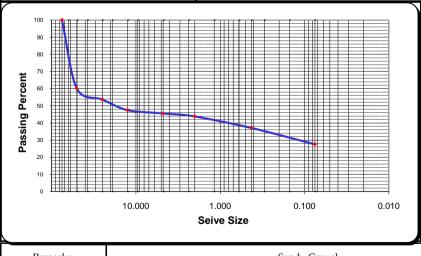
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil Invistigation Materials	Testing Date :	20/01/2014
Location :	Bore Hole # 08 (Depth 05 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88/ASTM C-136/BS-1377 Part 2

Sieve Size			Mass		Cumulative		Specification
		Retained	Mass	Retained	Passing	Limits	
Standard	Alter	native	g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in		3" De	owan Materials Gra	dation	
62.5 mm	2 1/2	in					
50.0 mm	2	in		1064.9	40.0	60.0	
37.5 mm	1 1/2	in					
25.0 mm	1	in		1235.5	46.4	53.6	
19.0 mm	3/4	in					
12.5 mm	1/2	in		1400.4	52.5	47.5	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			1450.9	54.4	45.6	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			1498.7	56.2	43.8	
1.18 mm	No. 16						
850µm	No. 20						
600 μm	No. 30						
425 μm	No. 40			1676.9	62.9	37.1	
300 μm	No. 50						
180 μm	No. 80				İ		
150 μm	No. 100				İ		
75 μm	No. 200			1932	72.5	27.5	
Pan				1	İ		

TOTAL Weight 2665 Grams



Remarks:

D 60

 D_{30}

 D_{10}

Си

Сс

Graval % 54.4

 Sand %
 18.1

 Finer
 27.5

Remarks: Sandy Gravel

Tested By

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

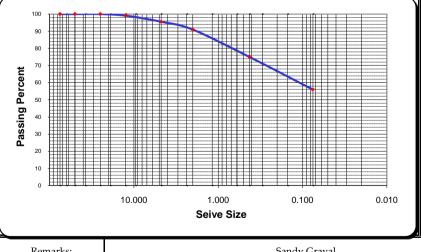
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil Invistigation Materials	Testing Date :	20/01/2014
Location :	Bore Hole # 08 (Depth 06 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88 / ASTM C-136 / BS-1377 Part 2

Sieve Size		Mass		Cumulative			
		Retained	Mass	Retained	Passing	Limits	
Standard	Alter	native	g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in					
62.5 mm	2 1/2	in					
50.0 mm	2	in		0	0.0	100.0	
37.5 mm	1 1/2	in					
25.0 mm	1	in		0	0.0	100.0	
19.0 mm	3/4	in					
12.5 mm	1/2	in		23.7	1.0	99.0	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			110.8	4.5	95.5	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			225.1	9.1	90.9	
1.18 mm	No. 16						
850µm	No. 20						
600 µm	No. 30						
425 μm	No. 40			621.5	25.0	75.0	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			1095.3	44.1	55.9	
Pan							
					-		

2485 Grams TOTAL Weight



Remarks:

 D_{60}

 D_{30}

 D_{10}

Си

Cc

Graval % 4.5

Sand % 39.6 55.9 Finer

Remarks: Sandy Graval

Tested By

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

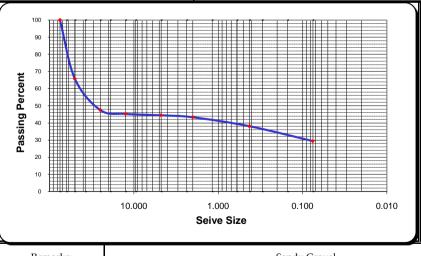
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil Invistigation Materials	Testing Date :	20/01/2014
Location :	Bore Hole # 08 (Depth 07 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88/ASTM C-136/BS-1377 Part 2

Sieve Size		Mass		Cumulative		Specification Limits	
		Retained	Mass	Retained	Passing		
Standard	Alter	native	g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in		3" D	owan Materials Gra	dation	
62.5 mm	2 1/2	in					
50.0 mm	2	in		659.3	34.3	65.7	
37.5 mm	1 1/2	in					
25.0 mm	1	in		1010.1	52.5	47.5	
19.0 mm	3/4	in					
12.5 mm	1/2	in		1052.9	54.7	45.3	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			1070	55.6	44.4	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			1091.1	56.7	43.3	
1.18 mm	No. 16						
850µm	No. 20						
600 μm	No. 30						
425 μm	No. 40			1191.6	61.9	38.1	
300 μm	No. 50				_		
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			1359.2	70.6	29.4	
Pan							

TOTAL Weight 1924 Grams



Remarks:

D 60

 D_{30}

 D_{10}

D 10

Си

Сс

 Graval %
 55.6

 Sand %
 15.0

Finer 29.4

Remarks: Sandy Gravel

Tested By

Construction Materials Testing Laboratory Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan **Tetra Tech Construction Company** Job No. KA-Geo-127 Client Name: Construction of Bridge # 09 at Gardez to Khost Road Sampling Date: 16/01/2014 Project Name : Description: Testing Date: 20/01/2014 Soil Invistigation Materials Location : Bore Hole # 08 (Depth 08 Meters) Sampled By: KA Rep, SIEVE ANALYSIS AASHTO T-27, T-88/ASTM C-136/BS-1377 Part 2 Specification Sieve Size Mass Cumulative Passing Retained Mass Retained Limits Standard Alternative g Retained (g) 100 mm 75.0 mm 62.5 mm 2 1/2 in in 50.0 mm 2 1 1/2 37.5 mm in 25.0 mm in 3/4 19.0 mm in 1/2 12.5 mm in 3/8 in 9.5 mm 1/4 in No. 4 4.75 mm 3.35 mm No. 6 No. 8 2.36 mm 2.00 mm No. 10 1.18 mm No. 16 No. 20 850µm No. 30 600 µm No. 40 425 µm No. 50 300 µm 180 μm 150 μm No. 100 No. 200 75 μm Pan **TOTAL** Weight Grams Remarks: D_{60} D_{30} D_{10} Си CcGraval % Sand % 10.000 1.000 0.100 0.010 Seive Size Finer Remarks: Sandy Gravel **Tested By** Lab Manager (QC)

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

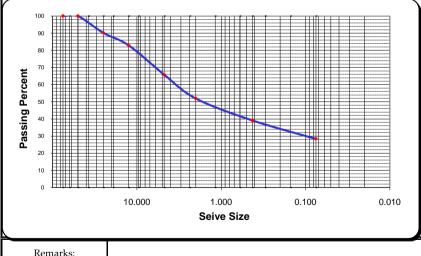
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil invistigation Materials	Testing Date :	20/01/2014
Location :	Bore Hole # 09 (Depth 01 Meter)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88/ASTM C-136/BS-1377 Part 2

Sieve Size		Mass	Cumulative			Specification	
			Retained	Mass	Retained	Passing	Limits
Standard	Alter	native	g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in					
62.5 mm	2 1/2	in					
50.0 mm	2	in		0	0.0	100.0	
37.5 mm	1 1/2	in					
25.0 mm	1	in		386.6	9.8	90.2	
19.0 mm	3/4	in					
12.5 mm	1/2	in		669.9	17.1	82.9	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			1341.4	34.1	65.9	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			1890.5	48.1	51.9	
1.18 mm	No. 16						
850µm	No. 20						
600 μm	No. 30						
425 μm	No. 40			2393.1	60.9	39.1	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			2813.4	71.6	28.4	
Pan							

3928 Grams TOTAL Weight



Remarks:

 D_{60}

 D_{30}

 D_{10}

Си

Cc

Graval % 34.1

Sand % 37.5 28.4 Finer

Remarks:

Tested By

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

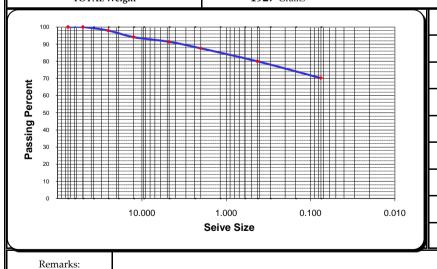
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil invistigation Materials	Testing Date :	20/01/2014
Location :	Bore Hole # 09 (Depth 02 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88/ASTM C-136/BS-1377 Part 2

Sieve Size			Mass		Cumulative	Specification	
			Retained	Mass	Retained	Passing	Limits
Standard	Alter	native	g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in					
62.5 mm	2 1/2	in					
50.0 mm	2	in		0	0.0	100.0	
37.5 mm	1 1/2	in					
25.0 mm	1	in		38.6	2.0	98.0	
19.0 mm	3/4	in					
12.5 mm	1/2	in		113.6	5.9	94.1	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			164.7	8.5	91.5	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			238.9	12.4	87.6	
1.18 mm	No. 16						
850µm	No. 20						
600 µm	No. 30						
425 μm	No. 40			385.6	20.0	80.0	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			573.9	29.8	70.2	
Pan							

1927 Grams TOTAL Weight



Remarks:

 D_{60}

 D_{30}

 D_{10}

Си

Cc

Graval % 8.5

Sand % 21.2 70.2

Finer

Tested By

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

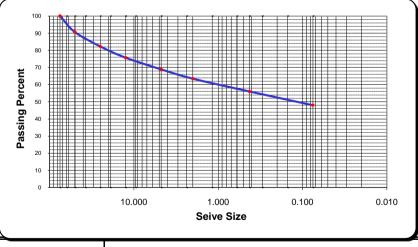
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil Invistigation Materials	Testing Date :	20/01/2014
Location :	Bore Hole # 09 (Depth 03 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88 / ASTM C-136 / BS-1377 Part 2

Sieve Size		Mass		Cumulative		Specification	
		Retained	Mass	Retained	Passing	Limits	
Standard	Alterna	ative	g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in					
62.5 mm	2 1/2	in					
50.0 mm	2	in		236.2	9.3	90.7	
37.5 mm	1 1/2	in					
25.0 mm	1	in		447.5	17.7	82.3	
19.0 mm	3/4	in					
12.5 mm	1/2	in		613.2	24.3	75.7	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			785.9	31.1	68.9	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			923.1	36.5	63.5	
1.18 mm	No. 16						
850µm	No. 20						
600 μm	No. 30						
425 μm	No. 40			1112.3	44.0	56.0	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			1315	52.0	48.0	
Pan							

TOTAL Weight 2527 Grams



D₆₀

D₃₀

D₁₀

Cu

Cc

Graval % 31.1

Sand % 20.9

Remarks:

Finer

Remarks:

Tested By

Lab Manager (QC)

48.0

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

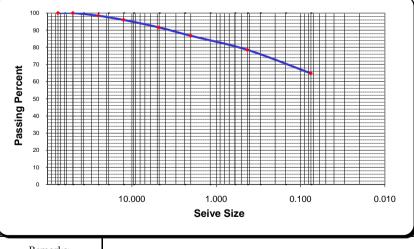
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil Invistigation Materials	Testing Date :	20/01/2014
Location :	Bore Hole # 09 (Depth 04 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88 / ASTM C-136 / BS-1377 Part 2

	Sieve Size		Mass		Specification		
			Retained	Mass	Retained	Passing	Limits
Standard	Alter	native	g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in		1			
62.5 mm	2 1/2	in					
50.0 mm	2	in		0	0.0	100.0	
37.5 mm	1 1/2	in					
25.0 mm	1	in		44.8	1.6	98.4	
19.0 mm	3/4	in					
12.5 mm	1/2	in		114.9	4.0	96.0	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			239.3	8.4	91.6	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			377.5	13.3	86.7	
1.18 mm	No. 16						
850µm	No. 20						
600 μm	No. 30						
425 μm	No. 40			610	21.5	78.5	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			999.8	35.2	64.8	
Pan							

2838 Grams TOTAL Weight



Remarks: D_{60}

 D_{30}

 D_{10}

Си

CcGraval % 8.4

Sand % 26.8 Finer 64.8

Remarks:

Tested By

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

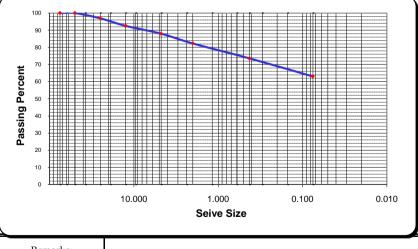
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil Invistigation Materials	Testing Date :	20/01/2014
Location :	Bore Hole # 09 (Depth 05 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88 / ASTM C-136 / BS-1377 Part 2

	Sieve Size				Specification		
			Retained	Mass	Retained	Passing	Limits
Standard	Alter	native	g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in					
62.5 mm	2 1/2	in					
50.0 mm	2	in		0	0.0	100.0	
37.5 mm	1 1/2	in					
25.0 mm	1	in		87.3	3.1	96.9	
19.0 mm	3/4	in					
12.5 mm	1/2	in		210.5	7.5	92.5	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			337.2	12.0	88.0	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			497.1	17.7	82.3	
1.18 mm	No. 16						
850µm	No. 20						
600 μm	No. 30						
425 μm	No. 40			740.6	26.4	73.6	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			1037.9	37.0	63.0	
Pan							
					-		

2803 Grams TOTAL Weight



 D_{60} D_{30} D_{10} Си Cc

Remarks:

Graval % 12.0 Sand % 25.0 Finer 63.0

Remarks:

Tested By

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

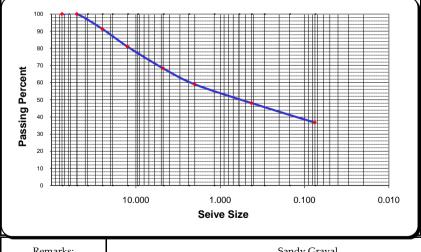
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil Invistigation Materials	Testing Date :	20/01/2014
Location :	Bore Hole # 09 (Depth 06 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88 / ASTM C-136 / BS-1377 Part 2

Sieve Size		Mass		Specification			
			Retained	Mass	Retained	Passing	Limits
Standard	Alter	native	g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in		1			
62.5 mm	2 1/2	in					
50.0 mm	2	in		0	0.0	100.0	
37.5 mm	1 1/2	in					
25.0 mm	1	in		298.7	8.7	91.3	
19.0 mm	3/4	in					
12.5 mm	1/2	in		654.2	19.0	81.0	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			1088	31.6	68.4	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			1408.1	41.0	59.0	
1.18 mm	No. 16						
850µm	No. 20						
600 μm	No. 30						
425 μm	No. 40			1786.4	52.0	48.0	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			2176.4	63.3	36.7	
Pan							

3438 Grams TOTAL Weight



Remarks:

 D_{60}

 D_{30}

 D_{10}

Си

Cc

Graval % 31.6

Sand % 31.7 36.7 Finer

Remarks: Sandy Graval

Tested By

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

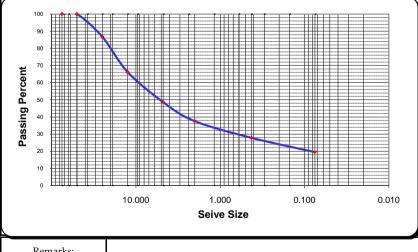
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil Invistigation Materials	Testing Date :	20/01/2014
Location :	Bore Hole # 09 (Depth 07 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88 / ASTM C-136 / BS-1377 Part 2

	Sieve Size				Specification		
			Retained	Mass	Retained	Passing	Limits
Standard	Alter	native	g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in					
62.5 mm	2 1/2	in					
50.0 mm	2	in		0	0.0	100.0	
37.5 mm	1 1/2	in					
25.0 mm	1	in		489.3	13.2	86.8	
19.0 mm	3/4	in					
12.5 mm	1/2	in		1252.8	33.8	66.2	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			1901.3	51.3	48.7	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			2313.4	62.5	37.5	
1.18 mm	No. 16						
850µm	No. 20						
600 µm	No. 30						
425 μm	No. 40			2674.9	72.2	27.8	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			2982.3	80.5	19.5	
Pan							
			i	-			-

3704 Grams TOTAL Weight



Remarks:

 D_{60}

 D_{30}

 D_{10}

Си

Cc

Graval % 51.3 Sand % 29.2

19.5 Finer

Remarks:

Tested By

Behind of Rahman Baba Collage Mirwais Maidan Kotai Sangi/Kabul-Afghanistan

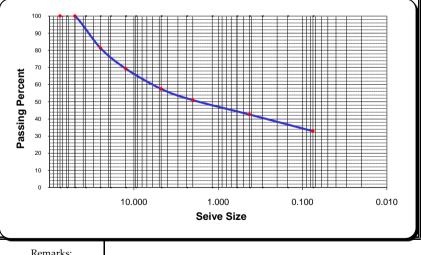
Client Name :	Tetra Tech Construction Company	Job No.	KA-Geo-127
Project Name :	Construction of Bridge # 09 at Gardez to Khost Road	Sampling Date:	16/01/2014
Description :	Soil Invistigation Materials	Testing Date :	20/01/2014
Location :	Bore Hole # 09 (Depth 08 Meters)	Sampled By:	KA Rep,

SIEVE ANALYSIS

AASHTO T-27, T-88/ASTM C-136/BS-1377 Part 2

Sieve Size			Mass		Specification		
			Retained	Mass	Retained	Passing	Limits
Standard	Alternative		g	Retained (g)	%	%	%
100 mm	4	in					
75.0 mm	3	in					
62.5 mm	2 1/2	in					
50.0 mm	2	in		0	0.0	100.0	
37.5 mm	1 1/2	in					
25.0 mm	1	in		389	18.6	81.4	
19.0 mm	3/4	in					
12.5 mm	1/2	in		642	30.7	69.3	
9.5 mm	3/8	in					
6.3 mm	1/4	in					
4.75 mm	No. 4			890.5	42.5	57.5	
3.35 mm	No. 6						
2.36 mm	No. 8						
2.00 mm	No. 10			1027.7	49.1	50.9	
1.18 mm	No. 16						
850µm	No. 20						
600 μm	No. 30						
425 μm	No. 40			1203.6	57.5	42.5	
300 μm	No. 50						
180 μm	No. 80						
150 μm	No. 100						
75 μm	No. 200			1406.9	67.2	32.8	
Pan							

2094 Grams TOTAL Weight



Remarks:

 D_{60}

 D_{30}

 D_{10}

Си

Cc

Graval % 42.5 Sand % 24.7

32.8 Finer

Remarks:

Tested By



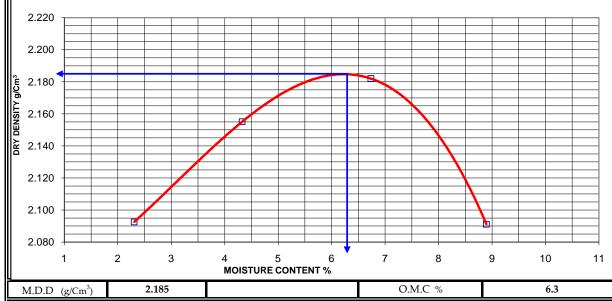
Behind of Rahman Baba College Mirwais Maidan kotai Sangi /Kabul -Afghanistan

MOISTURE DENSITY RELATION

AASHTO T-180 & ASTM D1557

Client Name :	Tetra Tech C	ra Tech Construction Company Job No.								A-Geo-127
Project Name :	Construction	n of Brid	ge # 09 at Gard	Sampling	Date :	1	6/01/2014			
Material :	Soil Sample	Sample						ite :	1	8/01/2014
Location :	Soil Sample	from T.F	near bore hol	le # 06			Sampled b	y:		KA Rep.
Method	С	Moul	d Weight (gm	s) 685	6	Mot	uld Volume	(CC)		2158
Determination No			1	2	3		4	5		6
Wt. of wet soil + N	lould	(gms)	11476	11708	1188	32	11770			/
Wt. of wet soil		(gms)	4620	4852	502	6	4914			
Wet density	(§	g/Cm ³)	2.141	2.248	2.32	9	2.277			
Dry doneity	- (α/Cm^3	2 093	2 155	2 18	2	2 091			

vvet density	(g/Cm)	2.141	2.240	2.329	2.277		/
Dry density	(g/Cm ³)	2.093	2.155	2.182	2.091		
Moisture Content %		1	2	3	4		Ι/
Container No.		A - 10	R - 1	A - 7	A - 13		/
Wt. of container	(gms)	41.8	62.2	56.1	52.5	/	1
Wt. of wet soil + Container	(gms)	427.5	445.6	453.8	445.5		
Wt. of dry soil + Container	(gms)	418.8	429.7	428.7	413.4		
Wt. of dry soil	(gms)	377	367.5	372.6	360.9		
Wt. of water	(gms)	8.7	15.9	25.1	32.1		
Moisture content	(%)	2.3	4.3	6.7	8.9	/	
						•	-



REMARKS

Tested By Lab Manager (QC)



Moisture content

Construction Materials Testing Laboratory

Behind of Rahman Baba College Mirwais Maidan kotai Sangi /Kabul -Afghanistan

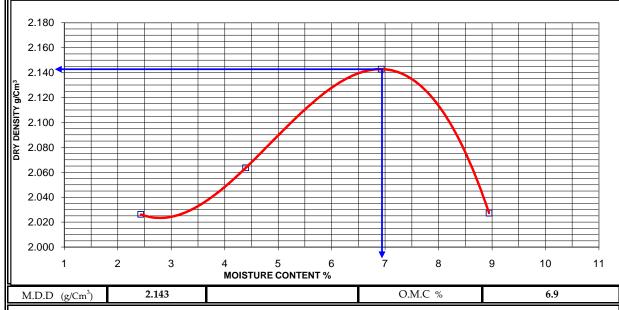
6.9

8.9

MOISTURE DENSITY RELATION

AASHTO T-180 & ASTM D1557

Client Name :	Tetra Tech C	Construc	tion Company	on Company				Job No.		KA-Geo-127	
Project Name :	Construction	of Brid	ge # 09 at Gardez to Khost Road				Sampling Date :		16/01/2014		
Material :	Soil Sample					Testing Date :		18/01/2014			
Location :	Soil Sample	from T.I	near bore hole # 08				Sampled by :		KA Rep.		
Method	C Mould		d Weight (gms) 4		5.5 Mo		ould Volume (CC)		2133.2		
Determination No.			1	2	3		4	5		6	
Wt. of wet soil + M	Iould (gms)	9393	9561	985	3	9677			/	
Wt. of wet soil (gms)		4427.5	4595.5	4887	.5	4711.5					
Wet density	(g	/Cm ³)	2.076	2.154	2.29	1	2.209				
Dry density	(8	g/Cm ³)	2.026	2.064	2.14	3	2.027				
Moisture Content %			1	2	3		4				
Container No.			C - 4	K - 9	J - 4		S - 2			/	
Wt. of container (gms)		46.7	58	62		54.4					
Wt. of wet soil + Container (gms)		501.8	473.8	421.	6	441.7					
Wt. of dry soil + Container (gms)		491	456.3	398.	3	409.9		/			
Wt. of dry soil (gms)		444.3	398.3	336.	3	355.5	355.5				
Wt. of water	((gms)	10.8	17.5	23.3	3	31.8				



2.4

(%)

REMARKS	

Tested By Lab Manager (QC)

Construction Materials Testing Laboratory Behind of Rahman baba collage Mirwais Maidan Kotai Sangi Kabul (Afghanistan) Client Name: Tetra Tech Construction Company Construction of Bridge # 09 at Gardez to Khost Road Job No: KA-Geo-127 Project Name: ATTERBERG LIMITS AASHTO 189/190 --- BS -1377 Part 2 Bore Hole No. 01, Depth = 01 Meter Sampling Date 16/01/2014 Location: Materials for Soil Invistigation Testing Date: 18/01/2014 Material: Soil Sampled By: K.A Rep. Description: Type of test: LIQUID LIMIT PLASTIC LIMIT Test number: 1 2 4 No. of blows: Non Plastic Material Container number: Wt. of wet soil + cont. g Wt. of dry soil + cont.: g Wt. of container: g Wt. of moisture: g Wt. of dry soil: g % Moisture content: Remarks: RESULTS LIQUID LIMIT 30.0 Non Plastic Material PLASTIC LIMIT Moisture Content 25.0 (PL) 20.0 PLASTICITY INDEX (PI) 15.0 10.0 SOIL CLASSIFICATION 10 100 No of Blows Tested By Lab Manager (QC)

Construction Materials Testing Laboratory Behind of Rahman baba collage Mirwais Maidan Kotai Sangi Kabul (Afghanistan) Client Name: Tetra Tech Construction Company Construction of Bridge # 09 at Gardez to Khost Road Job No: KA-Geo-127 Project Name: ATTERBERG LIMITS AASHTO 189/190 --- BS -1377 Part 2 Bore Hole No. 01, Depth = 02 Meters Sampling Date 16/01/2014 Location: Materials for Soil Invistigation Testing Date: 18/01/2014 Material: Soil Sampled By: K.A Rep. Description: Type of test: LIQUID LIMIT PLASTIC LIMIT Test number: 1 2 4 No. of blows: Non Plastic Material Container number: Wt. of wet soil + cont. g Wt. of dry soil + cont.: g Wt. of container: g Wt. of moisture: g Wt. of dry soil: g Moisture content: % Remarks: RESULTS LIQUID LIMIT 30.0 Non Plastic Material PLASTIC LIMIT Moisture Content 25.0 (PL) 20.0 PLASTICITY INDEX (PI) 15.0 10.0 SOIL CLASSIFICATION 10 100 No of Blows Tested By Lab Manager (QC)

Construction Materials Testing Laboratory Behind of Rahman baba collage Mirwais Maidan Kotai Sangi Kabul (Afghanistan) Client Name: Tetra Tech Construction Company Construction of Bridge # 09 at Gardez to Khost Road Job No: KA-Geo-127 Project Name: ATTERBERG LIMITS AASHTO 189/190 --- BS -1377 Part 2 Bore Hole No. 01, Depth = 03 Meters Sampling Date 16/01/2014 Location: Materials for Soil Invistigation Testing Date: 18/01/2014 Material: Soil Sampled By: K.A Rep. Description: Type of test: LIQUID LIMIT PLASTIC LIMIT Test number: 1 2 4 No. of blows: Non Plastic Material Container number: Wt. of wet soil + cont. g Wt. of dry soil + cont.: g Wt. of container: g Wt. of moisture: g Wt. of dry soil: g % Moisture content: Remarks: RESULTS LIQUID LIMIT 30.0 Non Plastic Material PLASTIC LIMIT Moisture Content 25.0 (PL) 20.0 PLASTICITY INDEX (PI) 15.0 10.0 SOIL 10 CLASSIFICATION 100 No of Blows Tested By Lab Manager (QC)

Construction Materials Testing Laboratory Behind of Rahman baba collage Mirwais Maidan Kotai Sangi Kabul (Afghanistan) Client Name: Tetra Tech Construction Company Construction of Bridge # 09 at Gardez to Khost Road Job No: KA-Geo-127 Project Name: ATTERBERG LIMITS AASHTO 189/190 --- BS -1377 Part 2 Bore Hole No. 01, Depth = 04 Meters Sampling Date 16/01/2014 Location: Materials for Soil Invistigation Testing Date: 18/01/2014 Material: Soil Sampled By: K.A Rep. Description: Type of test: LIQUID LIMIT PLASTIC LIMIT Test number: 1 2 4 No. of blows: Non Plastic Material Container number: Wt. of wet soil + cont. g Wt. of dry soil + cont.: g Wt. of container: g Wt. of moisture: g Wt. of dry soil: g % Moisture content: Remarks: RESULTS LIQUID LIMIT 30.0 Non Plastic Material PLASTIC LIMIT Moisture Content 25.0 (PL) 20.0 PLASTICITY INDEX (PI) 15.0 10.0 SOIL 10 CLASSIFICATION 100 No of Blows Tested By Lab Manager (QC)

Construction Materials Testing Laboratory Behind of Rahman baba collage Mirwais Maidan Kotai Sangi Kabul (Afghanistan) Client Name: Tetra Tech Construction Company Construction of Bridge # 09 at Gardez to Khost Road Job No: KA-Geo-127 Project Name: ATTERBERG LIMITS AASHTO 189/190 --- BS -1377 Part 2 Bore Hole No. 01, Depth = 05 Meters Sampling Date 16/01/2014 Location: Materials for Soil Invistigation Testing Date: 18/01/2014 Material: Soil Sampled By: K.A Rep. Description: Type of test: LIQUID LIMIT PLASTIC LIMIT Test number: 1 2 4 No. of blows: Non Plastic Material Container number: Wt. of wet soil + cont. g Wt. of dry soil + cont.: g Wt. of container: g Wt. of moisture: g Wt. of dry soil: g % Moisture content: Remarks: RESULTS LIQUID LIMIT 30.0 Non Plastic Material PLASTIC LIMIT Moisture Content 25.0 (PL) 20.0 PLASTICITY INDEX (PI) 15.0 10.0 SOIL 10 CLASSIFICATION 100 No of Blows Tested By Lab Manager (QC)

Construction Materials Testing Laboratory Behind of Rahman baba collage Mirwais Maidan Kotai Sangi Kabul (Afghanistan) Client Name: Tetra Tech Construction Company Construction of Bridge # 09 at Gardez to Khost Road Job No: KA-Geo-127 Project Name: ATTERBERG LIMITS AASHTO 189/190 --- BS -1377 Part 2 Bore Hole No. 01, Depth = 06 Meters Sampling Date 16/01/2014 Location: Materials for Soil Invistigation Testing Date: 18/01/2014 Material: Soil Sampled By: K.A Rep. Description: Type of test: LIQUID LIMIT PLASTIC LIMIT Test number: 1 2 4 No. of blows: Non Plastic Material Container number: Wt. of wet soil + cont. g Wt. of dry soil + cont.: g Wt. of container: g Wt. of moisture: g Wt. of dry soil: g % Moisture content: Remarks: RESULTS LIQUID LIMIT 30.0 Non Plastic Material PLASTIC LIMIT Moisture Content 25.0 (PL) 20.0 PLASTICITY INDEX (PI) 15.0 10.0 SOIL 10 CLASSIFICATION 100 No of Blows Tested By Lab Manager (QC)

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Construction Materials Testing Laboratory Behind of Rahman baba collage Mirwais Maidan Kotai Sangi Kabul (Afghanistan) Client Name: Tetra Tech Construction Company Construction of Bridge # 09 at Gardez to Khost Road Job No: KA-Geo-127 Project Name: ATTERBERG LIMITS AASHTO 189/190 --- BS -1377 Part 2 Bore Hole No. 02, Depth = 01 Meter Sampling Date 16/01/2014 Location: Materials for Soil Invistigation Testing Date: 18/01/2014 Material: Soil Sampled By: K.A Rep. Description: Type of test: LIQUID LIMIT PLASTIC LIMIT Test number: 1 2 4 No. of blows: Non Plastic Material Container number: Wt. of wet soil + cont. g Wt. of dry soil + cont.: g Wt. of container: g Wt. of moisture: g Wt. of dry soil: g % Moisture content: Remarks: RESULTS LIQUID LIMIT 30.0 Non Plastic Material PLASTIC LIMIT Moisture Content 25.0 (PL) 20.0 PLASTICITY INDEX (PI) 15.0 10.0 SOIL CLASSIFICATION 10 100 No of Blows Tested By Lab Manager (QC)

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Construction Materials Testing Laboratory Behind of Rahman baba collage Mirwais Maidan Kotai Sangi Kabul (Afghanistan) Client Name: Tetra Tech Construction Company Construction of Bridge # 09 at Gardez to Khost Road Job No: KA-Geo-127 Project Name: ATTERBERG LIMITS AASHTO 189/190 --- BS -1377 Part 2 Bore Hole No. 05, Depth = 01 Meter Sampling Date 16/01/2014 Location: Materials for Soil Invistigation Testing Date: 19/01/2014 Material: Soil Sampled By: Description: K.A Rep. Type of test: LIQUID LIMIT PLASTIC LIMIT Test number: 1 2 4 No. of blows: Non Plastic Material Container number: Wt. of wet soil + cont. g Wt. of dry soil + cont.: g Wt. of container: g Wt. of moisture: g Wt. of dry soil: g % Moisture content: Remarks: RESULTS LIQUID LIMIT 30.0 Non Plastic Material PLASTIC LIMIT Moisture Content 25.0 (PL) 20.0 PLASTICITY INDEX (PI) 15.0 10.0 SOIL CLASSIFICATION 10 100 No of Blows Tested By Lab Manager (QC)

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Construction Materials Testing Laboratory Behind of Rahman baba collage Mirwais Maidan Kotai Sangi Kabul (Afghanistan) Client Name: Tetra Tech Construction Company Construction of Bridge # 09 at Gardez to Khost Road Job No: KA-Geo-127 Project Name: ATTERBERG LIMITS AASHTO 189/190 --- BS -1377 Part 2 Bore Hole No. 05, Depth = 03 Meters Sampling Date 16/01/2014 Location: Materials for Soil Invistigation Testing Date: 19/01/2014 Material: Soil Sampled By: Description: K.A Rep. Type of test: LIQUID LIMIT PLASTIC LIMIT Test number: 1 2 4 No. of blows: Non Plastic Material Container number: Wt. of wet soil + cont. g Wt. of dry soil + cont.: g Wt. of container: g Wt. of moisture: g Wt. of dry soil: g % Moisture content: Remarks: RESULTS LIQUID LIMIT 30.0 Non Plastic Material PLASTIC LIMIT Moisture Content 25.0 (PL) 20.0 PLASTICITY INDEX (PI) 15.0 10.0 SOIL 10 CLASSIFICATION 100 No of Blows Tested By Lab Manager (QC)

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Construction Materials Testing Laboratory Behind of Rahman baba collage Mirwais Maidan Kotai Sangi Kabul (Afghanistan) Client Name: Tetra Tech Construction Company Construction of Bridge # 09 at Gardez to Khost Road Job No: KA-Geo-127 Project Name: ATTERBERG LIMITS AASHTO 189/190 --- BS -1377 Part 2 Bore Hole No. 05, Depth = 06 Meters Sampling Date 16/01/2014 Location: Materials for Soil Invistigation Testing Date: 19/01/2014 Material: Soil Sampled By: Description: K.A Rep. Type of test: LIQUID LIMIT PLASTIC LIMIT Test number: 1 2 4 No. of blows: Non Plastic Material Container number: Wt. of wet soil + cont. g Wt. of dry soil + cont.: g Wt. of container: g Wt. of moisture: g Wt. of dry soil: g % Moisture content: Remarks: RESULTS LIQUID LIMIT 30.0 Non Plastic Material PLASTIC LIMIT Moisture Content 25.0 (PL) 20.0 PLASTICITY INDEX (PI) 15.0 10.0 SOIL 10 CLASSIFICATION 100 No of Blows Tested By Lab Manager (QC)

Construction Materials Testing Laboratory Behind of Rahman baba collage Mirwais Maidan Kotai Sangi Kabul (Afghanistan) Client Name: Tetra Tech Construction Company Construction of Bridge # 09 at Gardez to Khost Road Job No: KA-Geo-127 Project Name: ATTERBERG LIMITS AASHTO 189/190 --- BS -1377 Part 2 Bore Hole No. 05, Depth = 07 Meters Sampling Date 16/01/2014 Location: Materials for Soil Invistigation Testing Date: 19/01/2014 Material: Soil Sampled By: Description: K.A Rep. Type of test: LIQUID LIMIT PLASTIC LIMIT Test number: 1 2 4 No. of blows: Non Plastic Material Container number: Wt. of wet soil + cont. g Wt. of dry soil + cont.: g Wt. of container: g Wt. of moisture: g Wt. of dry soil: g % Moisture content: Remarks: RESULTS LIQUID LIMIT 30.0 Non Plastic Material PLASTIC LIMIT Moisture Content 25.0 (PL) 20.0 PLASTICITY INDEX (PI) 15.0 10.0 SOIL 10 CLASSIFICATION 100 No of Blows Tested By Lab Manager (QC)

Construction Materials Testing Laboratory Behind of Rahman baba collage Mirwais Maidan Kotai Sangi Kabul (Afghanistan) Client Name: Tetra Tech Construction Company Construction of Bridge # 09 at Gardez to Khost Road Job No: KA-Geo-127 Project Name: ATTERBERG LIMITS AASHTO 189/190 --- BS -1377 Part 2 Bore Hole No. 05, Depth = 08 Meters Sampling Date 16/01/2014 Location: Materials for Soil Invistigation Testing Date: 19/01/2014 Material: Soil Sampled By: Description: K.A Rep. Type of test: LIQUID LIMIT PLASTIC LIMIT Test number: 1 2 4 No. of blows: Non Plastic Material Container number: Wt. of wet soil + cont. g Wt. of dry soil + cont.: g Wt. of container: g Wt. of moisture: g Wt. of dry soil: g % Moisture content: Remarks: RESULTS LIQUID LIMIT 30.0 Non Plastic Material PLASTIC LIMIT Moisture Content 25.0 (PL) 20.0 PLASTICITY INDEX (PI) 15.0 10.0 SOIL 10 CLASSIFICATION 100 No of Blows Tested By Lab Manager (QC)

Construction Materials Testing Laboratory Behind of Rahman baba collage Mirwais Maidan Kotai Sangi Kabul (Afghanistan) Client Name: Tetra Tech Construction Company Construction of Bridge # 09 at Gardez to Khost Road Job No: KA-Geo-127 Project Name: ATTERBERG LIMITS AASHTO 189/190 --- BS -1377 Part 2 Bore Hole No. 06, Depth = 01 Meter Sampling Date 16/01/2014 Location: Materials for Soil Invistigation Testing Date: 19/01/2014 Material: Soil Sampled By: K.A Rep. Description: Type of test: LIQUID LIMIT PLASTIC LIMIT Test number: 1 2 4 No. of blows: Non Plastic Material Container number: Wt. of wet soil + cont. g Wt. of dry soil + cont.: g Wt. of container: g Wt. of moisture: g Wt. of dry soil: g % Moisture content: Remarks: RESULTS LIQUID LIMIT 30.0 Non Plastic Material PLASTIC LIMIT Moisture Content 25.0 (PL) 20.0 PLASTICITY INDEX (PI) 15.0 10.0 SOIL CLASSIFICATION 10 100 No of Blows Tested By Lab Manager (QC)

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Behind of Rahman baba collage Mirwais Maidan Kotai Sangi Kabul (Afghanistan)

Client Name: Tetra Tech Construction Company

Remarks:

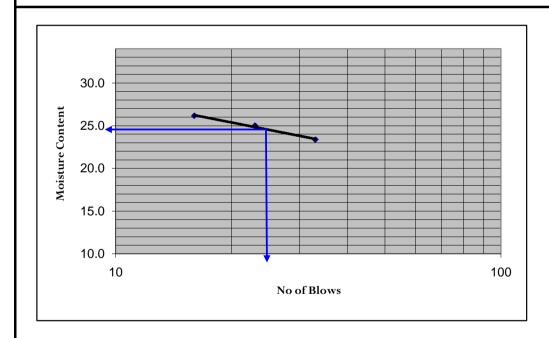
Project Name: Construction of Bridge # 09 at Gardez to Khost Road Job No: KA-Geo-127

ATTERBERG LIMITS

AASHTO 189/190 --- BS -1377 Part 2

Material:	Materials for Soil Invistigation	Testing Date:	20/01/2014
Material:	Materials for Soil Invistigation	Testing Date:	20/01/2014
	, 1		
Location:	Bore Hole No. 08, Depth = 03 Meters	Sampling Date:	16/01/2014

Type of test:		LIQUID LIMIT					CLIMIT
Test number:		1	2	3	4	1	2
No. of blows:		33	23	16	/		
Container number:		Z - 1	A - 3	A - 1		N - 2	
Wt. of wet soil + cont.	g	31.57	26.63	42.94		42.09	
Wt. of dry soil + cont.:	g	28.15	23.40	37.61		38.11	
Wt. of container:	g	13.51	10.47	17.23		17.31	
Wt. of moisture:	g	3.42	3.23	5.33		3.98	
Wt. of dry soil:	g	14.64	12.93	20.38		20.80	
Moisture content:	%	23.36	24.98	26.15	/	19.13	



LIQUID LIMIT
24.8

PLASTIC LIMIT
(PL)
19.1

PLASTICITY
INDEX (PI)
5.7

SOIL
CLASSIFICATION

19.13

Construction Materials Testing Laboratory Behind of Rahman baba collage Mirwais Maidan Kotai Sangi Kabul (Afghanistan) Client Name: Tetra Tech Construction Company Construction of Bridge # 09 at Gardez to Khost Road Job No: KA-Geo-127 Project Name: ATTERBERG LIMITS AASHTO 189/190 --- BS -1377 Part 2 Bore Hole No. 08, Depth = 04 Meters Sampling Date 16/01/2014 Location: Materials for Soil Invistigation Testing Date: 20/01/2014 Material: K.A Rep. Soil Sampled By: Description: Type of test: LIQUID LIMIT PLASTIC LIMIT Test number: 1 2 4 No. of blows: Non Plastic Material Container number: Wt. of wet soil + cont. g Wt. of dry soil + cont.: g Wt. of container: g Wt. of moisture: g Wt. of dry soil: g % Moisture content: Remarks: RESULTS LIQUID LIMIT 30.0 Non Plastic Material PLASTIC LIMIT Moisture Content 25.0 (PL) 20.0 PLASTICITY INDEX (PI) 15.0 10.0 SOIL 10 CLASSIFICATION 100 No of Blows Tested By Lab Manager (QC)

Construction Materials Testing Laboratory Behind of Rahman baba collage Mirwais Maidan Kotai Sangi Kabul (Afghanistan) Client Name: Tetra Tech Construction Company Construction of Bridge # 09 at Gardez to Khost Road Job No: KA-Geo-127 Project Name: ATTERBERG LIMITS AASHTO 189/190 --- BS -1377 Part 2 Bore Hole No. 08, Depth = 05 Meters Sampling Date 16/01/2014 Location: Materials for Soil Invistigation Testing Date: 20/01/2014 Material: Soil Sampled By: Description: K.A Rep. Type of test: LIQUID LIMIT PLASTIC LIMIT Test number: 1 2 4 No. of blows: 34 23 15 Non plastic Material A - 15 G - 5 Container number: B - 2 34.04 Wt. of wet soil + cont. 34.19 29.54 Wt. of dry soil + cont.: g 30.72 26.42 30.12 14.19 12.60 13.69 Wt. of container: g Wt. of moisture: 3.47 3.12 3.92 g Wt. of dry soil: g 16.53 13.82 16.43 % 22.58 23.86 Moisture content: 20.99 Remarks: RESULTS LIQUID LIMIT 22.1 30.0 PLASTIC LIMIT Moisture Content 25.0 (PL) 20.0 **PLASTICITY** INDEX (PI) 15.0 10.0 SOIL 10 CLASSIFICATION 100 No of Blows Tested By Lab Manager (QC)

Construction Materials Testing Laboratory Behind of Rahman baba collage Mirwais Maidan Kotai Sangi Kabul (Afghanistan) Client Name: Tetra Tech Construction Company

	ATTERBERG LIMITS AASHTO 189/190 BS -1377 Part 2		
Location:	Bore Hole No. 08, Depth = 06 Meters	Sampling Date	16/01/2014
Material:	Materials for Soil Invistigation	Testing Date:	20/01/2014

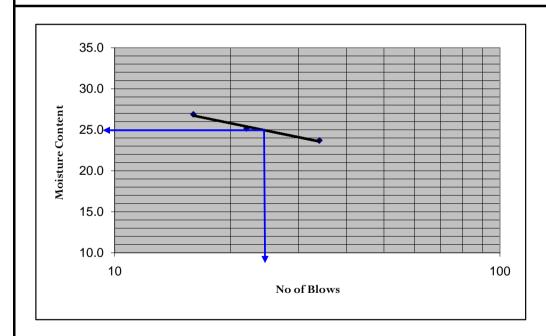
Job No:

Construction of Bridge # 09 at Gardez to Khost Road

Project Name:

Remarks:

Description: Soil				Sample	ed By:		K.A Rep.	
Type of test:			LIQU	JID LIMIT			PLASTIC LIMIT	
Test number:		1	2	3		4	1	2
No. of blows:		34	22	16		/		
Container number:		N - 1	A - 9	G - 18			A - 8	
Wt. of wet soil + cont.	g	37.00	34.97	36.3			32.12	
Wt. of dry soil + cont.:	g	33.43	30.48	31.52			28.78	
Wt. of container:	g	18.35	12.63	13.74	/	/	11.02	
Wt. of moisture:	g	3.57	4.49	4.78			3.34	
Wt. of dry soil:	g	15.08	17.85	17.78			17.76	
Moisture content:	%	23.67	25.15	26.88		•	18.81	



RESULTS
LIQUID LIMIT
25.0
PLASTIC LIMIT
(PL)
18.8
PLASTICITY
INDEX (PI)
6.2
SOIL
CLASSIFICATION

18.81

KA-Geo-127

Construction Materials Testing Laboratory Behind of Rahman baba collage Mirwais Maidan Kotai Sangi Kabul (Afghanistan) Client Name: Tetra Tech Construction Company Construction of Bridge # 09 at Gardez to Khost Road Job No: KA-Geo-127 Project Name: ATTERBERG LIMITS AASHTO 189/190 --- BS -1377 Part 2 Bore Hole No. 08, Depth = 07 Meters Sampling Date 16/01/2014 Location: Materials for Soil Invistigation Testing Date: 20/01/2014 Material: Soil Sampled By: Description: K.A Rep. Type of test: LIQUID LIMIT PLASTIC LIMIT Test number: 1 2 4 No. of blows: 34 23 15 Plon plastic Material C - 4 F - 10 Container number: N - 8 Wt. of wet soil + cont. 33.99 36.82 36.95 Wt. of dry soil + cont.: g 30.56 33.42 33.23 13.92 18.40 17.77 Wt. of container: g Wt. of moisture: 3.43 3.40 3.72 g Wt. of dry soil: g 16.64 15.02 15.46 % 24.06 Moisture content: 20.61 22.64 Remarks: RESULTS 35.0 LIQUID LIMIT 22.1 30.0 PLASTIC LIMIT Moisture Content (PL) 25.0 20.0 **PLASTICITY** INDEX (PI) 15.0 10.0 SOIL 10 CLASSIFICATION 100 No of Blows Tested By Lab Manager (QC)

Construction Materials Testing Laboratory Behind of Rahman baba collage Mirwais Maidan Kotai Sangi Kabul (Afghanistan) Client Name: Tetra Tech Construction Company Construction of Bridge # 09 at Gardez to Khost Road Job No: KA-Geo-127 Project Name: ATTERBERG LIMITS AASHTO 189/190 --- BS -1377 Part 2 Bore Hole No. 08, Depth = 08 Meters Sampling Date 16/01/2014 Location: Materials for Soil Invistigation Testing Date: 20/01/2014 Material: K.A Rep. Soil Sampled By: Description: Type of test: LIQUID LIMIT PLASTIC LIMIT Test number: 1 2 No. of blows: Container number: Bed Rock Wt. of wet soil + cont. g Wt. of dry soil + cont.: g Wt. of container: g Wt. of moisture: g Wt. of dry soil: g % Moisture content: Remarks: RESULTS LIQUID LIMIT 30.0 ed Rock PLASTIC LIMIT Moisture Content 25.0 (PL) 20.0 PLASTICITY INDEX (PI) 15.0 10.0 SOIL CLASSIFICATION 10 100 No of Blows Tested By Lab Manager (QC)

Construction Materials Testing Laboratory Behind of Rahman baba collage Mirwais Maidan Kotai Sangi Kabul (Afghanistan) Client Name: Tetra Tech Construction Company Construction of Bridge # 09 at Gardez to Khost Road Job No: KA-Geo-127 Project Name: ATTERBERG LIMITS AASHTO 189/190 --- BS -1377 Part 2 Bore Hole No. 09, Depth = 01 Meter Sampling Date 16/01/2014 Location: Materials for Soil Invistigation Testing Date: 20/01/2014 Material: Soil Sampled By: K.A Rep. Description: Type of test: LIQUID LIMIT PLASTIC LIMIT Test number: 1 2 4 No. of blows: Non Plastic Material Container number: Wt. of wet soil + cont. g Wt. of dry soil + cont.: g Wt. of container: g Wt. of moisture: g Wt. of dry soil: g % Moisture content: Remarks: RESULTS LIQUID LIMIT 30.0 Non Plastic Material PLASTIC LIMIT Moisture Content 25.0 (PL) 20.0 PLASTICITY INDEX (PI) 15.0 10.0 SOIL CLASSIFICATION 10 100 No of Blows Tested By Lab Manager (QC)

Behind of Rahman baba collage Mirwais Maidan Kotai Sangi Kabul (Afghanistan)

Client Name: Tetra Tech Construction Company

Project Name: Construction of Bridge # 09 at Gardez to Khost Road Job No: KA-Geo-127

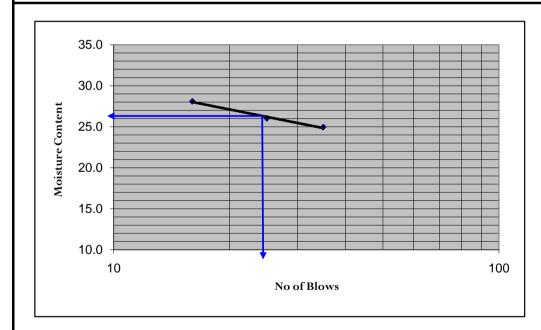
ATTERBERG LIMITS

AASHTO 189/190 --- BS -1377 Part 2

Description:	Soil	Sampled By:	K.A Rep.
Material:	Materials for Soil Invistigation	Testing Date:	21/01/2014
Location:	Bore Hole No. 09, Depth = 02 Meters	Sampling Date:	16/01/2014

Type of test:			LIQU	IID LIMIT		PLASTI	CLIMIT
Test number:		1	2	3	4	1	2
No. of blows:		35	25	16	/		
Container number:		A - 17	A - 4	A - 7		S-12	
Wt. of wet soil + cont.	g	36.94	31.63	29.22		36.08	
Wt. of dry soil + cont.:	g	32.77	27.77	25.66		32.41	
Wt. of container:	g	16.05	12.93	12.99		13.82	
Wt. of moisture:	g	4.17	3.86	3.56		3.67	
Wt. of dry soil:	g	16.72	14.84	12.67		18.59	
Moisture content:	%	24.94	26.01	28.10	/	19.74	

Remarks: 19.74



PLASTICITY
INDEX (PI)
6.5
SOIL
CLASSIFICATION

Behind of Rahman baba collage Mirwais Maidan Kotai Sangi Kabul (Afghanistan)

Client Name: Tetra Tech Construction Company

Remarks:

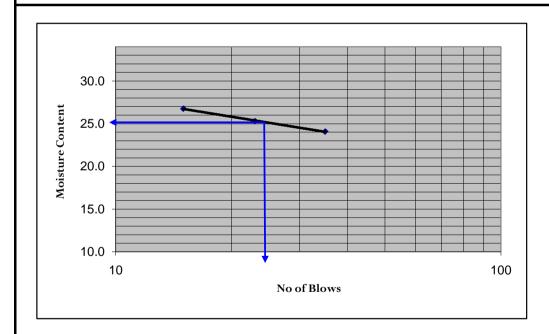
Project Name: Construction of Bridge # 09 at Gardez to Khost Road Job No: KA-Geo-127

ATTERBERG LIMITS

AASHTO 189/190 --- BS -1377 Part 2

Description:	Soil	Sampled By :	K.A Rep.
Material:	Materials for Soil Invistigation	Testing Date:	21/01/2014
Location:	Bore Hole No. 09, Depth = 03 Meters	Sampling Date:	16/01/2014

Type of test:			LIQUID LIMIT				
Test number:		1	2	3	4	1	2
No. of blows:		35	23	15	/		
Container number:		A - 14	A - 6	N - 4		S-5	
Wt. of wet soil + cont.	g	31.29	32.81	40.93		36.13	
Wt. of dry soil + cont.:	g	27.61	28.92	36.08		32.82	
Wt. of container:	g	12.32	13.54	17.95		15.50	
Wt. of moisture:	g	3.68	3.89	4.85		3.31	
Wt. of dry soil:	g	15.29	15.38	18.13		17.32	
Moisture content:	%	24.07	25.29	26.75	/	19.11	



RESULTS

LIQUID LIMIT
25.1

PLASTIC LIMIT
(PL)
19.1

PLASTICITY
INDEX (PI)
6.0

SOIL
CLASSIFICATION

19.11

Behind of Rahman baba collage Mirwais Maidan Kotai Sangi Kabul (Afghanistan)

Client Name: Tetra Tech Construction Company

Remarks:

Project Name: Construction of Bridge # 09 at Gardez to Khost Road Job No: KA-Geo-127

ATTERBERG LIMITS

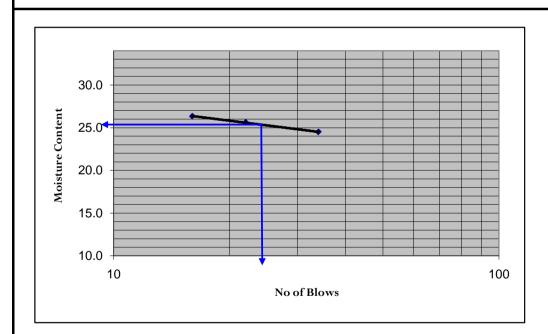
AASHTO 189/190 --- BS -1377 Part 2

 Location :
 Bore Hole No. 09, Depth = 04 Meters
 Sampling Date :
 16/01/2014

 Material :
 Materials for Soil Invistigation
 Testing Date :
 20/01/2014

 Description :
 Soil
 Sampled By :
 K.A Rep.

Type of test:			LIQUID LIMIT				CLIMIT
Test number:		1	2	3	4	1	2
No. of blows:		34	22	16			
Container number:		C - 9	A - 11	B - 5		D - 7	
Wt. of wet soil + cont.	g	42.86	37.79	41.13		28.47	
Wt. of dry soil + cont.:	g	37.84	33.22	36.63		26.11	
Wt. of container:	g	17.34	15.38	19.54		13.74	
Wt. of moisture:	g	5.02	4.57	4.50		2.36	
Wt. of dry soil:	g	20.50	17.84	17.09		12.37	
Moisture content:	%	24.49	25.62	26.33		19.08	



LIQUID LIMIT
25.3

PLASTIC LIMIT
(PL)
19.1

PLASTICITY
INDEX (PI)
6.2

SOIL
CLASSIFICATION

19.08

Behind of Rahman baba collage Mirwais Maidan Kotai Sangi Kabul (Afghanistan)

Client Name: Tetra Tech Construction Company

Remarks:

Project Name: Construction of Bridge # 09 at Gardez to Khost Road Job No: KA-Geo-127

ATTERBERG LIMITS

AASHTO 189/190 --- BS -1377 Part 2

 Location :
 Bore Hole No. 09, Depth = 05 Meters
 Sampling Date :
 16/01/2014

 Material :
 Materials for Soil Invistigation
 Testing Date :
 21/01/2014

 Description :
 Soil
 Sampled By :
 K.A Rep.

Type of test:			LIQUID LIMIT				
Test number:		1	2	3	4	1	2
No. of blows:		35	25	17			
Container number:		A - 6	B - 4	C-7		D - 22	
Wt. of wet soil + cont.	g	41.49	37.58	41.13		28.47	
Wt. of dry soil + cont.:	g	39.63	35.81	37.29		26.44	
Wt. of container:	g	31.27	28.52	22.57		15.38	
Wt. of moisture:	g	1.86	1.77	3.84		2.03	
Wt. of dry soil:	g	8.36	7.29	14.72		11.06	
Moisture content:	%	22.25	24.28	26.09		18.35	

30.0 25.0 20.0 15.0 100 No of Blows

PLASTICITY
INDEX (PI)

5.8

SOIL
CLASSIFICATION

18.35

Construction Materials Testing Laboratory Behind of Rahman baba collage Mirwais Maidan Kotai Sangi Kabul (Afghanistan) Client Name: Tetra Tech Construction Company Construction of Bridge # 09 at Gardez to Khost Road Job No: KA-Geo-127 Project Name: ATTERBERG LIMITS AASHTO 189/190 --- BS -1377 Part 2 Bore Hole No. 09, Depth = 06 Meters Sampling Date 16/01/2014 Location: Materials for Soil Invistigation Testing Date: 21/01/2014 Material: Soil Sampled By: Description: K.A Rep. Type of test: LIQUID LIMIT PLASTIC LIMIT Test number: 1 2 4 No. of blows: 34 23 15 Won plastic Material C - 7 C - 21 X - 10 Container number: Wt. of wet soil + cont. 38.52 39.55 40.06 Wt. of dry soil + cont.: g 35.61 37.07 36.86 22.51 26.32 23.78 Wt. of container: g Wt. of moisture: 2.91 2.48 3.20 g Wt. of dry soil: g 13.10 10.75 13.08 % 22.21 23.07 24.46 Moisture content: Remarks: RESULTS 35.0 LIQUID LIMIT 23.0 30.0 PLASTIC LIMIT Moisture Content (PL) 25.0 20.0 **PLASTICITY** INDEX (PI) 15.0 10.0 SOIL 10 CLASSIFICATION 100 No of Blows Tested By Lab Manager (QC)

Construction Materials Testing Laboratory Behind of Rahman baba collage Mirwais Maidan Kotai Sangi Kabul (Afghanistan) Client Name: Tetra Tech Construction Company Construction of Bridge # 09 at Gardez to Khost Road Job No: KA-Geo-127 Project Name: ATTERBERG LIMITS AASHTO 189/190 --- BS -1377 Part 2 Bore Hole No. 09, Depth = 07 Meters Sampling Date 16/01/2014 Location: Materials for Soil Invistigation Testing Date: 20/01/2014 Material: Soil Sampled By: K.A Rep. Description: Type of test: LIQUID LIMIT PLASTIC LIMIT Test number: 1 2 4 No. of blows: Non Plastic Material Container number: Wt. of wet soil + cont. g Wt. of dry soil + cont.: g Wt. of container: g Wt. of moisture: g Wt. of dry soil: g % Moisture content: Remarks: RESULTS LIQUID LIMIT 30.0 Non Plastic Material PLASTIC LIMIT Moisture Content 25.0 (PL) 20.0 PLASTICITY INDEX (PI) 15.0 10.0 SOIL 10 CLASSIFICATION 100 No of Blows Tested By Lab Manager (QC)

Construction Materials Testing Laboratory Behind of Rahman baba collage Mirwais Maidan Kotai Sangi Kabul (Afghanistan) Client Name: Tetra Tech Construction Company Construction of Bridge # 09 at Gardez to Khost Road Job No: KA-Geo-127 Project Name: ATTERBERG LIMITS AASHTO 189/190 --- BS -1377 Part 2 Bore Hole No. 09, Depth = 08 Meters Sampling Date 16/01/2014 Location: Materials for Soil Invistigation Testing Date: 20/01/2014 Material: Soil Sampled By: Description: K.A Rep. Type of test: LIQUID LIMIT PLASTIC LIMIT Test number: 1 2 4 No. of blows: 33 23 15 Non plastic Material A - 18 Container number: S-1 A - 20 34.04 Wt. of wet soil + cont. 34.45 34.75 Wt. of dry soil + cont.: g 30.27 30.53 29.62 12.30 13.60 9.17 Wt. of container: g Wt. of moisture: 3.77 3.92 5.13 g Wt. of dry soil: g 17.97 16.93 20.45 % 25.09 Moisture content: 20.98 23.15 Remarks: RESULTS 35.0 LIQUID LIMIT 22.7 30.0 PLASTIC LIMIT Moisture Content (PL) 25.0 20.0 **PLASTICITY** INDEX (PI) 15.0 10.0 SOIL 10 CLASSIFICATION 100 No of Blows Tested By Lab Manager (QC)



Water Analysis / Quality Testing Laboratory

	,		
Client Name	Tetra Tech C.C	Case Sheet No:	WQTL/KA-05-2014
Contractor	Tetra Tech C.C	Sample Date	1/17/2014
Project Name	Laka Tiga	Testing Date	1/18/2014
Source Material:	Bore Hole #01/ mater # 1.50 cm	Location	Laka Tiga
Description:	Chemical & Microbilogical Analysis of Water	Purpose	Drinking

S. No	Water Quality Parameter	Unit	Value Found	WHO Limits	Method
1	Ph	_	8.24	6.5-8.5	4500-H+.B
2	Chloride as Cl-1	mg/1	36.00	250.00	4500-CI. B
3	Sulphate as SO ₄ -2	mg/1	39.00	250.00	65- Tannin
4					
5					
6					
7					
8					
9			-		
10			-		
11			-		
12					
13					
14					
15					
16			-		
17				and the same of th	

Behind Rahman Baba College, Kota Sangi, Kabul Afghanistan
Cell Phones: 0700-212414 / 0786-501032, Email: ka laboratory@yahoo.cor



		vvater	Testing Laboratory				
Tetra Tech C.C				Case Sheet No: WQTL/KA-05-201			
	Contractor Tetra Tech C.C Project Name Laka Tiga				Sample Date	1/17/2014	
Project	Name	Laka Tiga			Testing Date	1/18/2014	
Source	Material:	Bore Hole #03/ mater # 1.5	0 cm		Location	Laka Tiga	
Descrip	tion:	Chemical & Microbilogical A	Analysis of W	Purpose	Drinking		
S. No	Water (Quality Parameter	Unit	Value Found	WHO Limits	Method	
1	Ph		-	7.28	6.5-8.5	4500-H+.B	
2	Chloride as (mg/1	28.00	250.00	4500-CI. B	
3	Sulphate as	SO ₄ -2	mg/1	10.01	250.00	65- Tannin	
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							



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Water Analysis / Quality Testing Laboratory

Client Name	Tetra Tech C.C	Case Sheet No	: WQTL/KA-05-2014			
Contractor	Tetra Tech C.C	Sample Date	1/17/2014			
Project Name	Laka Tiga	Testing Date	1/18/2013			
Source Material:	Bore Hole #05/ mater # 1.50 cm	Location	Laka Tiga			
	Chemical & Microbilogical Analysis of Water	Purpose	Drinking			

S. No	Water Quality Parameter	Unit	Value Found	WHO Limits	Method
1	Ph	-	7.23	6.5-8.5	4500-H+.B
2	Chloride as CI-1	mg/1	8.00	250.00	4500-CI. B
3	Sulphate as SO ₄ -2	mg/1	40.00	250.00	65- Tannin
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					

Remarks:

On the basis of above results, Chemically all the parameters lie within the permissible limits of WHO standards

AFGHAN DPRE

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Water Analysis / Quality Testing Laboratory

	, , , , , , , , , , , , , , , , , , , ,	The second secon	
Client Name	Tetra Tech C.C	Case Sheet No:	WQTL/KA-05-2014
	Tetra Tech C.C	Sample Date	1/17/2014
Contractor	Laka Tiga	Testing Date	1/18/2013
Project Name		Location	Laka Tiga
	Chemical & Microbilogical Analysis of Water	Purpose	Drinking
Description:	Chemical & Microbilogical Artalysis of VValer	1 41 2 4	

S. No	Water Quality Parameter	Unit	Value Found	WHO Limits	Method
1	Ph	_	7.36	6.5-8.5	4500-H+.B
2	Chloride as Cl-1	mg/1	6.06	250.00	4500-CI. B
3	Sulphate as SO ₄ -2	mg/1	65.00	250.00	65- Tannin
4					
5					
6					
7					
8					
9					
10					
11			_		
12					
13					
14			-		
15					
16			1		
17					NAME OF TAXABLE PARTY.

On the basis of above results, Chemically all the parameters lie within the permissible limits of WHO standards



- 3
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Water Analysis / Quality Testing Laboratory

	ent Name Tetra Tech C.C			Case Sheet No:		
Contra		Tetra Tech C.C			Sample Date	1/17/2014
Project Name Source Material:		Laka Tiga			Testing Date	1/18/2014
		Bore Hole #09/ mater # 1.5	0 cm	Location	Laka Tiga	
Descrip	otion:	Chemical & Microbilogical A	nalysis of W	/ater	Purpose	Drinking
S. No	Water (Water Quality Parameter		Value Found	WHO Limits	Method
1	Ph		-	7.47	6.5-8.5	4500-H+.B
2	Chloride as		mg/1	18.01	250.00	4500-CI. B
3	Sulphate as	SO ₄₋₂	mg/1	31.00	250.00	65- Tannin
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						

Remarks

On the basis of above results, Chemically all the parameters lie within the permissible limits of WHO standards.



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- 3 KA shall assume and assure that the particular samples are truly representative of any batch or stock or lot or entire production only when its representative shall have performed the sampling.
- While every possible precaution was exercised to ensure accuracy of the results KA does not assume any responsibility for the accuracy of results beyond the limit and acope of the available methods employed and the validity of the results for the purpose (s) for which the results may be used.

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Client Name: Tetra Tech Construction Company

Project Name : Construction of Bridge # 09 at Gardez to Khost Road

Source of Sample : Bore Hole # 04 & 07

Sample By : KA Rep.

Date of Sampling : 16/01/2014

Job Number : KA-Geo-127

ASTM D-4829

EXPANSION INDEX OF SOIL SAMPLE

All the materials collected from site are sandy gravel. So the test Expansion Index over such materials is not applicable.

Laboratory Manager KA Laboratory Kabul Afghanistan



REMARKS

Construction Materials Testing Laboratory

Behind of Rahman Baba College Mirwais Maidan kotai Sangi /Kabul -Afghanistan

	_					
Organic Content ASTM D 2974						
Client Name :	Tetra Te	ch Construction Company	n Construction Company Job No:		KA-Geo-127	
Project Name :	Bridge # 09 at Gardez to Khost Road		Testing Date :	21/01/2014		
Material :	River Bed Materials			Tested By:	PCSIR Pakistan	
Location :	Bore Ho	le # 03		Sampled by:	KA Rep,	
PCSIR Test Report No:		1144	PCSIR Lab Code No:		PLC/ILO/510/01	
PCSIR Case No:		ILS/ATR/1144/2014	Sourse of Sample:		Bore Hole # 03	
1						

	TEST OF SAMPLE								
SR NO:	SAMPLE Description	Organic Content Gms/Kg	Result (%)	Remarks					
1	0.75 Meters Depth	1.90	0.19	Tested at 750 °C					
2	2.25 Meters Depth	0.80	0.08	Tested at 750 °C					

Dronovod Pro	Lah Managar (OC)
Prepared By	Lab Manager (QC)



REMARKS

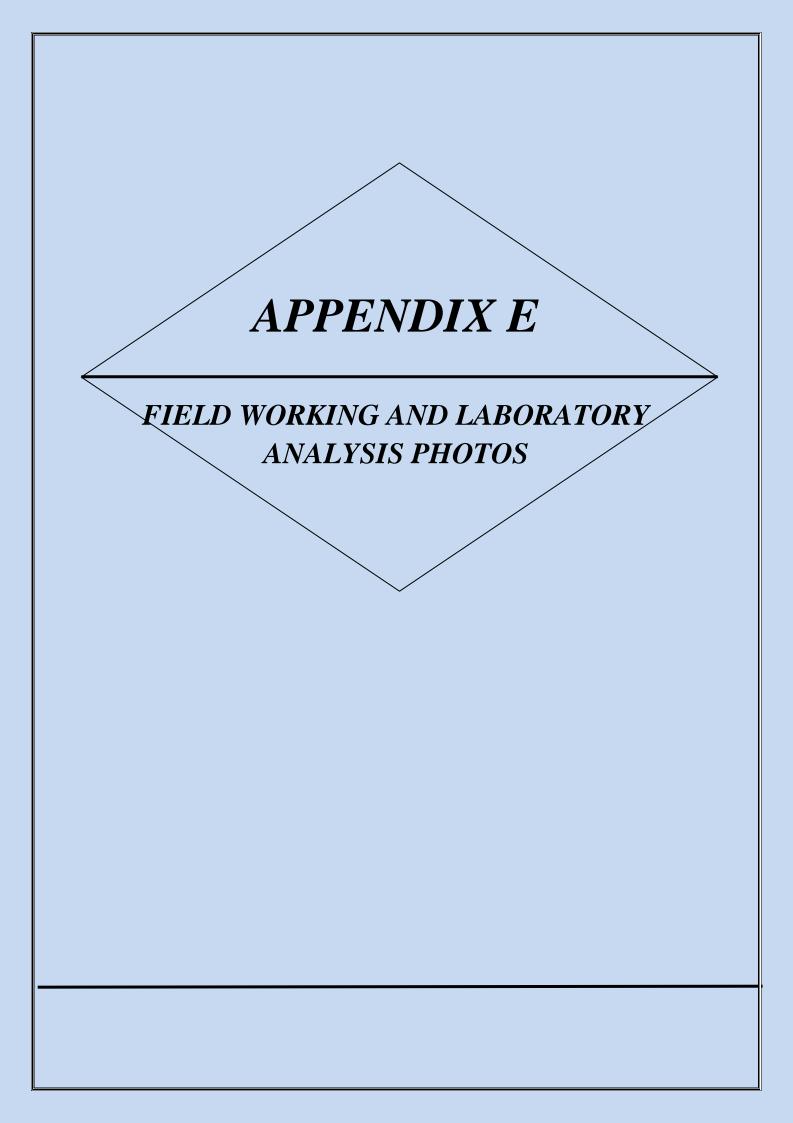
Construction Materials Testing Laboratory

Behind of Rahman Baba College Mirwais Maidan kotai Sangi /Kabul -Afghanistan

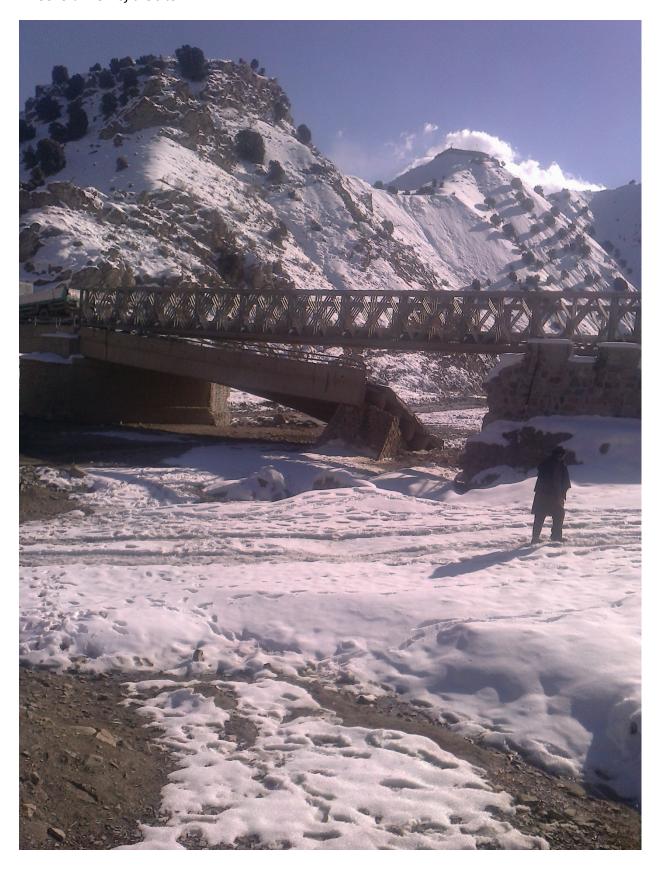
Organic Content ASTM D 2974						
Client Name :	Tetra Tech Construction Company			Job No:	KA-Geo-127	
Project Name :	Bridge # 09 at Gardez to Khost Road			Testing Date :	21/01/2014	
Material :	Soil Sample from Bore Hole # 07			Tested By:	PCSIR Pakistan	
Location :				Sampled by :	KA Rep,	
PCSIR Test Report No:		1144	PCSIR Lab Code No:		PLC/ILO/510/01	
PCSIR Case No:		ILS/ATR/1144/2014	Sourse of Sample:		Bore Hole # 07	
.1						

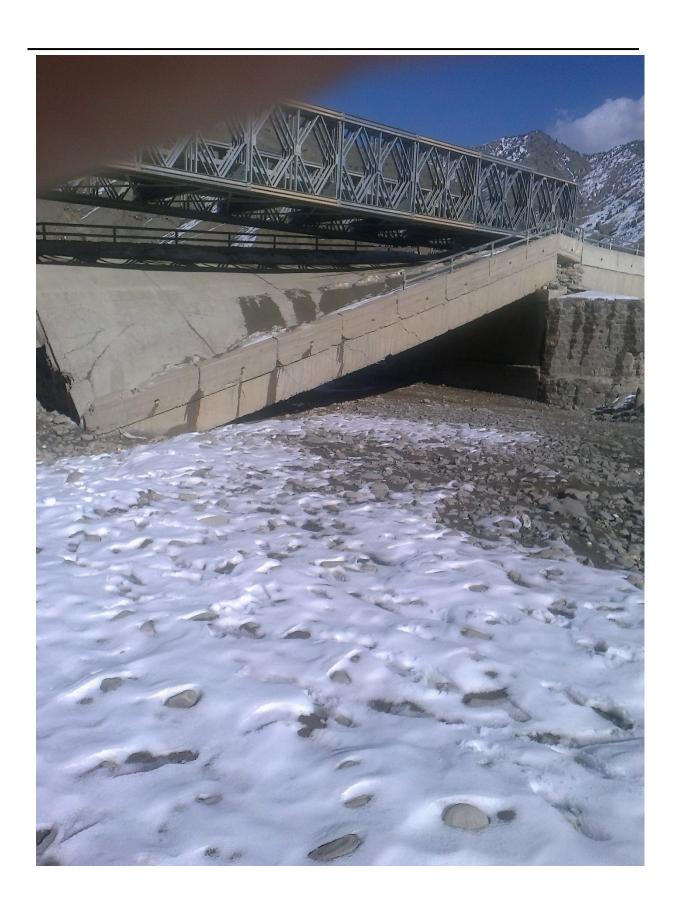
	TEST OF SAMPLE								
SR NO:	SAMPLE Description Organic Content Gms/Kg		Result (%)	Remarks					
1	0.75 Meters Depth	2.60	0.26	Tested at 750 °C					
2	2.25 Meters Depth 2.30		0.23	Tested at 750 °C					

Prepare	ed By	Lab Manager (QC)



1- General view of the site



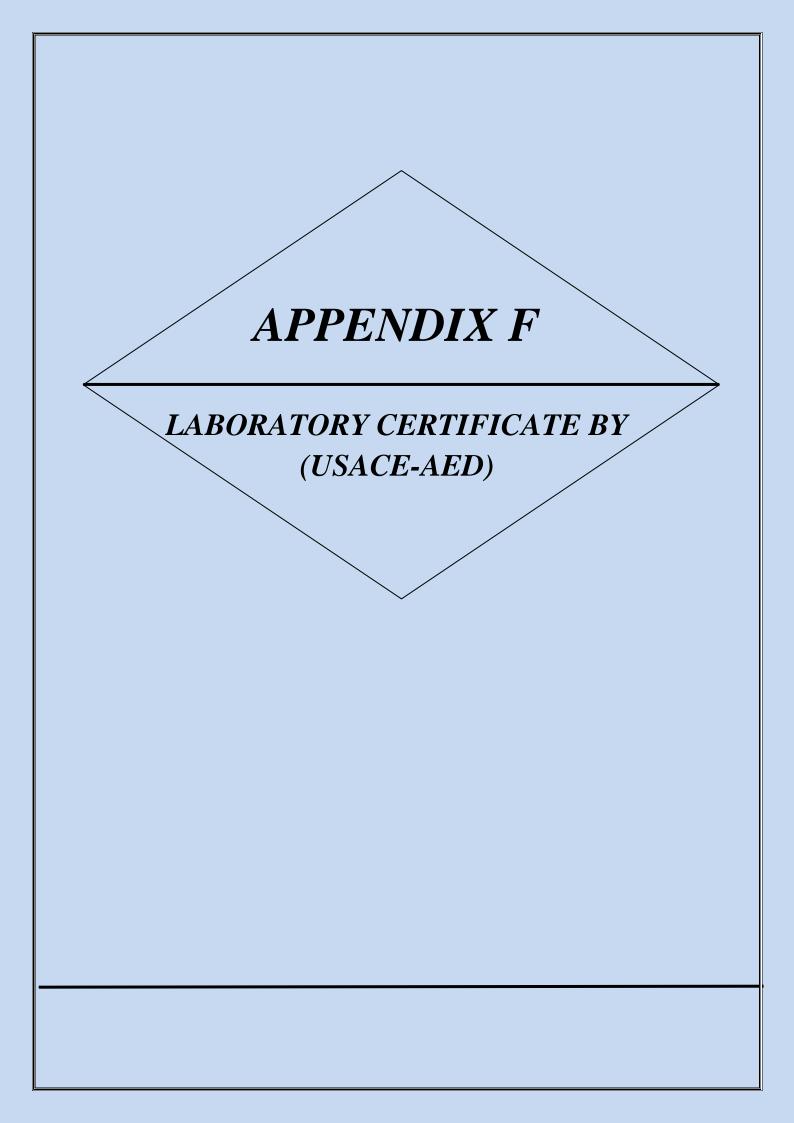


2- Site activity Photos











DEPARTMENT OF THE ARMY

TRANSATLANTIC AFGHANISTAN DISTRICT U.S. ARMY CORPS OF ENGINEERS ENGINEERING & CONSTRUCTION APO AE 09356

CETAA-EC January 04, 2013

SUBJECT: Karkon Afghan Darwish (KA) Materials Testing Lab - Laboratory Certification to 31 December, 2015

REFERENCES:

A. Karkon Afghan Darwish (KA) Materials Testing Lab at Kabul - Laboratory Inspection & Certification Site Visit Findings of 06 October, 2013 & 02 January, 2014

This letter confirms the Certification for the Karkon Afghan Darwish (KA) Materials Testing Lab to 31 December, 2015 at the following location: Kabul, Afghanistan.

This laboratory should be considered as certified for use by the Transatlantic Afghanistan District, U.S. Army Corps of Engineers (USACE), for the material tests as listed in enclosure 1. This certification will be included with records that are maintained at the TAA Headquarters in Kabul, Afghanistan. This certification is contingent upon the continued employment of Mr. Muhammad Basir, as Deputy Director and Mr. Zahoor Ahmad as the Laboratory Manager. Without the oversight of these gentlemen, this certification will expire. If the laboratory relocates to a new location, this certification will expire. This certification is also contingent upon, at a minimum, the annual calibration of equipment by a third party.

The inspection and certification process followed by the Transatlantic Afghanistan District adheres to procedures outlined by the Materials Testing Center (MTC), which is located at the Geotechnical and Structures Laboratory (GSL), U.S. Army Engineer Research and Development Center (ERDC) in Vicksburg, Mississippi, USA. The MTC is the USACE-authorized agency for certifying laboratories for use in quality control testing for USACE construction projects. To facilitate construction in Afghanistan, the Transatlantic Afghanistan District has authorized the Quality Assurance Manager to conduct laboratory certifications with adherence to MTC protocol.



Quality Assurance Manager Transatlantic Afghanistan District U.S. Army Corps of Engineers

ENCLOSURES:

1. KA Materials Testing Lab @ Kabul - Certified Material Tests

KA @ Kabul

Soils:

AASHTO T 092	Standard Method of Test for Determining the Shrinkage Factors of Soils
AASHTO T 093	Standard Specification for Determining the Field Moisture Equivalent of Soils
AASHTO T 224	Standard Method of Test for Correction for Coarse Particles in the Soil Compaction Test
ASTM D 0421	Standard Practice for Dry Preparation of Soil Samples for Particle-Size Analysis and Determination of Soil Constants
ASTM D 0422	Standard Test Method for Particle-Size Analysis of Soils
ASTM D 0558	Standard Test Methods for Moisture-Density (Unit Weight) Relations of Soil-Cement Mixtures
ASTM D 0698	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort
ASTM D 0854	Standard Test Methods for Specific Gravity of Soil Solids by Water Pycnometer
ASTM D 1140	Standard Test Methods for Amount of Material in Soils Finer than No. 200 (75-μm) Sieve
ASTM D 1556	Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method
ASTM D 1557	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort
ASTM D 1883	Standard Test Method for CBR (California Bearing Ratio) of Laboratory-Compacted Soils
ASTM D 2166	Standard Test Method for Unconfined Compressive Strength of Cohesive Soil
ASTM D 2216	Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
ASTM D 2487	Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
ASTM D 2488	Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)
ASTM D 3017	Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)
ASTM D 3282	Standard Practice for Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes
ASTM D 3740	Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
ASTM D 4220	Standard Practices for Preserving and Transporting Soil Samples
ASTM D 4318	Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D 4643	Standard Test Method for Determination of Water (Moisture) Content of Soil by Microwave Oven Heating
ASTM D 4718	Standard Practice for Correction of Unit Weight and Water Content for Soils Containing Oversize Particles
ASTM D 6938	Standard Test Method for In-Place Density and Water Content of Soil and Soil- Aggregate by Nuclear Methods (Shallow Depth) (Use instead of ASTM D 2922)
ASTM D 6951	Standard Test Method for Use of the Dynamic Cone Penetrometer in Shallow Pavement Applications
ASTM E 0011	Standard Specification for Woven Wire Test Sieve Cloth and Test Sieves
BS 1377-2	Methods of test for Soils for civil engineering purposes — Part 2: Classification tests
CRD-C 654	Standard Test Method for Determining the California Bearing Ratio of Soils

Advanced Soils:

ASTM D 1241

KA @ Kabul

ASTM D 1196	Standard Test Method for Nonrepetitive Static Plate Load Tests of Soils and Flexible Pavement Components, for Use in Evaluation and Design of Airport and Highway Pavements
ASTM D 1586	Standard Test Method for Standard Penetration Test (SPT) and Split-Barrel Sampling of Soils
ASTM D 2113	Standard Practice for Rock Core Drilling and Sampling of Rock for Site Investigation
ASTM D 2435	Standard Test Methods for One-Dimensional Consolidation Properties of Soils Using Incremental Loading
ASTM D 2850	Standard Test Method for Unconsolidated-Undrained Triaxial Compression Test on Cohesive Soils
ASTM D 3080	Standard Test Method for Direct Shear Test of Soils Under Consolidated Drained Conditions
ASTM D 3550	Standard Practice for Thick Wall, Ring-Lined, Split Barrel, Drive Sampling of Soils
ASTM D 4767	Standard Test Method for Consolidated Undrained Triaxial Compression Test for Cohesive Soils
ASTM D 6528	Standard Test Method for Consolidated Undrained Direct Simple Shear Testing of Cohesive Soils
Aggregates:	
ASTM C 0029	Standard Test Method for Bulk Density ("Unit Weight") and Voids in Aggregate
ASTM C 0040	Standard Test Method for Organic Impurities in Fine Aggregates for Concrete
ASTM C 0070	Standard Test Method for Surface Moisture in Fine Aggregate
ASTM C 0088	Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
ASTM C 0117	Standard Test Method for Materials Finer than 75-µm (No. 200) Sieve in Mineral Aggregates by Washing
ASTM C 0127	Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Coarse Aggregate
ASTM C 0128	Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Fine Aggregate
ASTM C 0131	Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
ASTM C 0136	Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM C 0142	Standard Test Method for Clay Lumps and Friable Particles in Aggregates
ASTM C 0144	Standard Specification for Aggregate for Masonry Mortar
ASTM C 0289	Standard Test Method for Potential Alkali-Silica Reactivity of Aggregates (Chemical Method)
ASTM C 0404	Standard Specification for Aggregates for Masonry Grout
ASTM C 0535	Standard Test Method for Resistance to Degradation of Large-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
ASTM C 0566	Standard Test Method for Total Evaporable Moisture Content of Aggregate by Drying
ASTM C 0702	Standard Practice for Reducing Samples of Aggregate to Testing Size
ASTM C 0897	Standard Specification for Aggregate for Job-Mixed Portland Cement-Based Plasters
ASTM C 1252	Standard Test Methods for Uncompacted Void Content of Fine Aggregate (as Influenced by Particle Shape, Surface Texture, and Grading)
ASTM D 0075	Standard Practice for Sampling Aggregates
ACTN4 D 1241	Chandrad Country for Makerial for Call Assessment Culture Dans and Confere Country

 ${\tt Standard\ Specification\ for\ Materials\ for\ Soil-Aggregate\ Subbase,\ Base,\ and\ Surface\ Courses}$

KA @ Kabul

ASTM D 2419	Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate
ASTM D 4791	Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate
ASTM D 4944	Standard Test Method for Field Determination of Water (Moisture) Content of Soil by the Calcium Carbide Gas Pressure Tester
ASTM D 5821	Standard Test Method for Determining the Percentage of Fractured Particles in Coarse Aggregate
BS 812 Section 105.1	Testing aggregates — Part 105: Methods for determination of particle shape Section 105.1 Flakiness index
CRD-C 171	Standard Test Method for Determining Percentage of Crushed Particles in Aggregate

Cement, Grout, Mortar, & Concrete:

les	
AASHTO T 026	Standard Method of Test for Quality of Water to Be Used in Concrete
ASTM C 0031	Standard Practice for Making and Curing Concrete Test Specimens in the Field
ASTM C 0039	Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
ASTM C 0042	Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete
ASTM C 0109	Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50-mm] Cube Specimens)
ASTM C 0138	Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete
ASTM C 0143	Standard Test Method for Slump of Hydraulic-Cement Concrete
ASTM C 0172	Standard Practice for Sampling Freshly Mixed Concrete
ASTM C 0174	Standard Test Method for Measuring Thickness of Concrete Elements Using Drilled Concrete Cores
ASTM C 0187	Standard Test Method for Amount of Water Required for Normal Consistency of Hydraulic Cement Paste
ASTM C 0188	Standard Test Method for Density of Hydraulic Cement
ASTM C 0191	Standard Test Methods for Time of Setting of Hydraulic Cement by Vicat Needle
ASTM C 0192	Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory
ASTM C 0231	Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C 0270 REV A	Standard Specification for Mortar for Unit Masonry
ASTM C 0293	Standard Test Method for Flexural Strength of Concrete (Using Simple Beam With Center-Point Loading)
ASTM C 0430	Standard Test Method for Fineness of Hydraulic Cement by the 45-μm (No. 325) Sieve
ASTM C 0470	Standard Specification for Molds for Forming Concrete Test Cylinders Vertically
ASTM C 0476	Standard Specification for Grout for Masonry
ASTM C 0511	Standard Specification for Mixing Rooms, Moist Cabinets, Moist Rooms, and Water Storage Tanks Used in the Testing of Hydraulic Cements and Concretes
ASTM C 0617	Standard Practice for Capping Cylindrical Concrete Specimens
ASTM C 0778	Standard Specification for Standard Sand
ASTM C 0803	Standard Test Method for Penetration Resistance of Hardened Concrete

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ASTM C 0805	Standard Test Method for Rebound Number of Hardened Concrete
ASTM C 0926 REV A	Standard Specification for Application of Portland Cement-Based Plaster
ASTM C 1019	Standard Test Method for Sampling and Testing Grout
ASTM C 1064	Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete
ASTM C 1077	Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation
ASTM C 1084	Standard Test Method for Portland-Cement Content of Hardened Hydraulic-Cement Concrete
ASTM C 1231	Standard Practice for Use of Unbonded Caps in Determination of Compressive Strength of Hardened Concrete Cylinders
ASTM C 1602	Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete

Asphalt Cement and Asphalt Concrete:

3.83	2
AASHTO T 059	Standard Method of Test for Emulsified Asphalts
AASHTO T 079	Standard Method of Test for Flash Point with Tag Open-Cup Apparatus for Use with Material Having a Flash Point Less Than 93°C (200°F)
AASHTO T 102	Standard Method of Test for Spot Test of Asphaltic Materials
AASHTO T 182	Standard Method of Test for Coating and Stripping of Bitumen-Aggregate Mixtures
AASHTO T 230	Standard Method of Test for Determining Degree of Pavement Compaction of Bituminous Aggregate Mixtures
AASHTO T 283	Standard Method of Test for Resistance of Compacted Hot Mix Asphalt (HMA) to Moisture-Induced Damage
ASTM D 0005	Standard Test Method for Penetration of Bituminous Materials
ASTM D 0036	Standard Test Method for Softening Point of Bitumen (Ring-and-Ball Apparatus)
ASTM D 0070	Standard Test Method for Density of Semi-Solid Bituminous Materials (Pycnometer Method)
ASTM D 0092	Standard Test Method for Flash and Fire Points by Cleveland Open Cup Tester
ASTM D 0113	Standard Test Method for Ductility of Bituminous Materials
ASTM D 0140	Standard Test Method for Ductility of Bituminous Materials
ASTM D 0242	Standard Specification for Mineral Filler For Bituminous Paving Mixtures
ASTM D 0546	Standard Test Method for Sieve Analysis of Mineral Filler for Bituminous Paving Mixtures
ASTM D 0979	Standard Practice for Sampling Bituminous Paving Mixtures
ASTM D 2041	Standard Test Method for Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures
ASTM D 2042	Standard Test Method for Solubility of Asphalt Materials in Trichloroethylene
ASTM D 2726	Standard Test Method for Bulk Specific Gravity and Density of Non-Absorptive Compacted Bituminous Mixtures
ASTM D 2950	Standard Test Method for Density of Bituminous Concrete in Place by Nuclear Methods
ASTM D 3203	Standard Test Method for Percent Air Voids in Compacted Dense and Open Bituminous Paving Mixtures
ASTM D 3549	Standard Test Method for Thickness or Height of Compacted Bituminous Paving Mixture Specimens

KA @ Kabul

ASTM D 3665	Standard Practice for Random Sampling of Construction Materials
ASTM D 3666	Standard Specification for Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials
ASTM D 5361	Standard Practice for Sampling Compacted Bituminous Mixtures for Laboratory Testing
ASTM D 5444	Standard Test Method for Mechanical Size Analysis of Extracted Aggregate
ASTM D 6926	Standard Practice for Preparation of Bituminous Specimens Using Marshall Apparatus
ASTM D 6927	Standard Test Method for Marshall Stability and Flow of Bituminous Mixtures
CRD-C 649	Standard Test Method for Unit Weight, Marshall Stability, and Flow of Bituminous Mixtures
CRD-C 650	Standard Method for Density and Percent Voids of Compacted Bituminous Paving Mixtures
CRD-C 652	Standard Test Method for Measurement of Reduction in Marshall Stability of Bituminous Mixtures Caused by Immersion in Water

Bricks, Stone, & CMUs:

ASTM C 0062	Standard Specification for Building Brick (Solid Masonry Units Made From Clay or Shale)
ASTM C 0067	Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile
ASTM C 0090	Standard Specification for Loadbearing Concrete Masonry Units
ASTM C 0140	Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units
ASTM C 1093	Standard Practice for Accreditation of Testing Agencies for Masonry
ASTM C 1552	Standard Practice for Capping Concrete Masonry Units, Related Units and Masonry Prisms for Compression Testing
Steel:	
AASHTO T 285	Standard Method of Test for Bend Test for Bars for Concrete Reinforcement
W.	Standard Method of Test for Bend Test for Bars for Concrete Reinforcement Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength
AASHTO T 285	
AASHTO T 285 ASTM A 0307	Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength
AASHTO T 285 ASTM A 0307 ASTM A 0370	Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength Standard Test Methods and Definitions for Mechanical Testing of Steel Products Standard Specification for Deformed and Plain Carbon-Steel Bars for

Water: (See lab for details)